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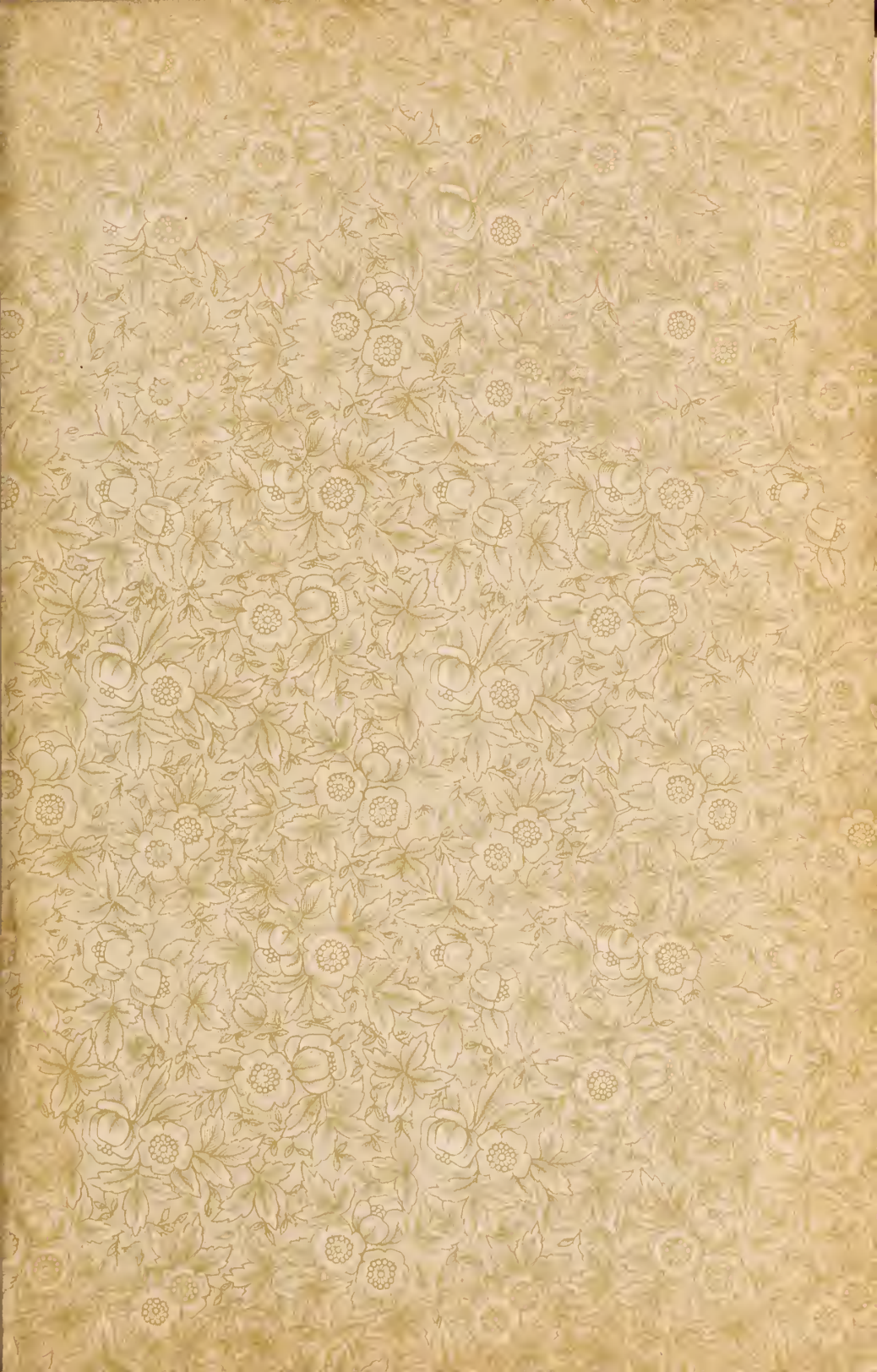
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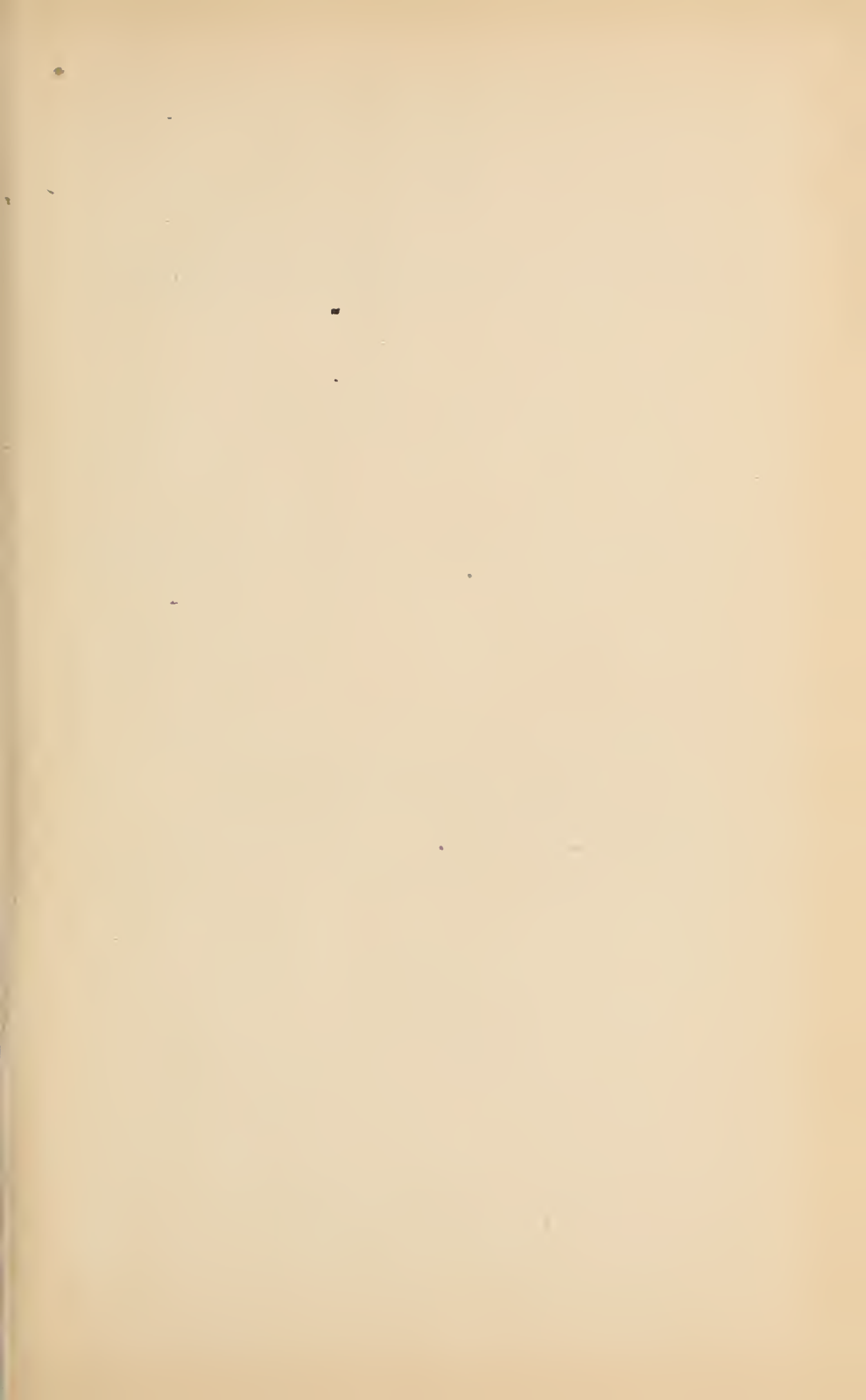
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THE
BROOKLYN MEDICAL JOURNAL

PUBLISHED MONTHLY

BY THE

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

EDITORIAL COMMITTEE:

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VOLUME III.
JANUARY—DECEMBER, 1889.

MEDICAL SOCIETY OF CO. OF KINGS,
356 BRIDGE STREET,
BROOKLYN, N. Y.

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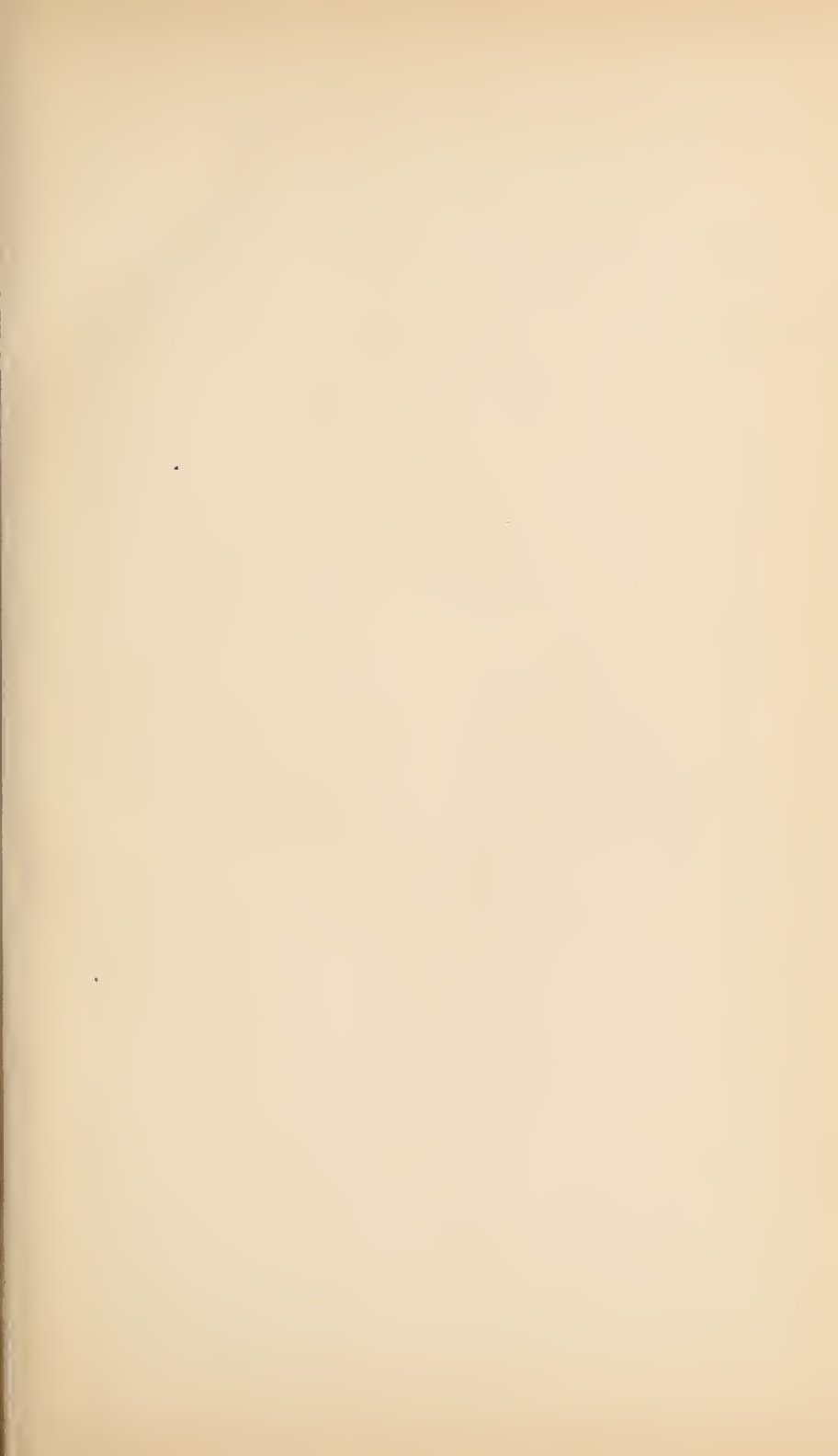
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THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III. BROOKLYN, N. Y., JANUARY, 1889. No. I.

ORIGINAL ARTICLES.

PELVIC CELLULITIS.

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Read before the Medical Society of the County of Kings, October 16, 1888.

Professional opinion has recently changed very much regarding pelvic cellulitis.

It was formerly held that this was a very common affection, and the chief element in the development of the great majority of pelvic abscesses. It was also taught that there was a chronic form of cellulitis which might continue for an indefinite time without reaching the stage of suppuration. With the exception of pelvic peritonitis, which came in for a share of attention, little was said about any other pelvic inflammation outside of the uterus. But since the knowledge of diseases of the Fallopian tubes and ovaries has been developed, pelvic cellulitis is considered by many to be comparatively rare. Those who are the most positive in their opinions on this subject, claim that when it does occur it is often secondary to an inflammation of the ovaries or tubes. The tendency seems to be, especially among the laparotomists, towards the other extreme, in regard to the comparative frequency of pelvic cellulitis, and inflammation of the ovaries, tubes and pelvic peritonæum.

Granting that this affection is rare compared with its supposed frequency in former times, there is no doubt that it occurs as a primary inflammation often enough to call for a large share of attention. Nothing new has been brought out regarding the pathology, except that chronic cellulitis, which has been a cherished notion with some, has been in the past few years denied an existence by good observers. I have also observed a peculiar complication of this affection which has not been noticed before, so far as I know, viz., an extension of the inflammation from the broad ligament to the sheath of the psoas muscle; the pus from the primary abscess burrowing outwards and upwards.

In regard to its causation, I am satisfied that it is brought about in three different ways, the most common of which is septic infection following parturition, during which there has been some solution of continuity in the parturient canal. In many cases the inflammation of the cellular tissue is preceded by a septic lymphangitis. Contusions of the cellular tissue, during difficult delivery or surgical treatment, may also lead to inflammation in the same way that contused wounds of the subcutaneous cellular tissue cause inflammation and abscess. The same thing takes place in rupture of a blood-vessel giving rise to a subperitoneal pelvic hæmatocele. In several cases I have been able to trace a pelvic abscess in the cellular tissue to this cause. In all such cases the cellulitis is a primary inflammation, and due to sepsis.

Lastly, in cases of pyosalpinx or abscess of an ovary accompanied with pelvic peritonitis and large exudation, the pus may burrow along the track of the vessels through the broad ligament into the cellular tissue, and there cause a secondary inflammation or cellulitis.

The differential diagnosis has been advanced somewhat, but has not quite kept pace with the new views in pathology. In ill-defined cases it is always difficult, sometimes impossible, to say whether the inflammation affects the pelvic peritonæum or the cellular tissue. In inflammation of the tubes or ovaries, uncomplicated, the mobility of the uterus and the shape and location of the tumor are signs that can be relied upon with a degree of certainty, but this is all that can be said. Fortunately, it is not necessary to make an exact diagnosis so far as regards general treatment. It is only where there is an abscess present that requires surgical interference, that accuracy of diagnosis is called for. Then it is very essential that the location of the abscess should be determined, also its origin if possible, because upon these facts in the diagnosis, the question of whether the abscess should be opened through the vagina or by laparotomy, can be judiciously settled. Sometimes the treatment employed is decided according to the surgical proclivities of the attendant, rather than the condition of the

patient. If the surgeon has had success in such cases by an opening through the vagina, he will be likely to elect this method. On the other hand, if he is saturated with the amateur craving for laparotomy, he will choose that way of getting at the trouble.

The physical conditions by which I have been guided are these. When the products of the inflammation are low down in the pelvis and within easy reach, and the wall of the abscess is adherent to the vaginal wall, as indicated by the fixation of the tissues, I prefer to open by the vagina. On the other hand, if the abscess is high up, and the vagina is free, laparotomy is preferable. There is an exception to this rule which will be noted while briefly discussing the treatment.

My remarks about the management of cellulitis will be confined to the surgical treatment in the suppurative state. Before the formation of an abscess in cellulitis I know of no operative treatment that has been employed except aspirating. Dr. V. O. Hardin has aspirated during the stage of serous effusion with very gratifying results. I have not tried this treatment, but I had one experience with a similar method which was very fortunate.

The case was a bilateral cellulitis in which the transudation and exudation were so extensive as to arrest the functions of the pelvic organs, and impair the circulation and threaten necrosis of the tissues. Dr. E. N. Chapman saw her in consultation and consented to my making an incision from the vagina, in the hope of finding pus. Accordingly I made several punctures with a narrow-bladed knife, with the effect of producing a very free oozing of bloody serum. We both thought that the patient must die unless some relief could be obtained and hence we risked this apparently rash treatment. The discharge of serum continued for several days. There was no abscess found. She made a perfect recovery and had children afterwards.

In cases in which pus has formed but its escape is delayed, the question of aspirating comes to mind and may be employed, I think, with advantage. I have practised it with success several times. In some cases the pus has reaccumulated and a second or third aspirating has been required. There is an advantage in washing out the sac with antiseptic fluid as practised in abscesses elsewhere; care should be taken not to overdilute the sac with the fluid injected, for fear of rupture. Authorities might be quoted in favor of this method of treatment, but it will suffice to refer to a paper by Dr. Lyman, of Boston, published in the transactions of the American Gynecological Society in 1881. I notice of late years that some of the authorities have abandoned aspirating, believing it to be dangerous. This, I presume, comes from the bad results which came from aspirating in pyosalpinx or abscess of the ovaries. In such cases I am sure that it is dangerous,

but in abscess of the cellular tissue it is safe and sufficiently effective in such cases as I have referred to, to warrant its holding a place in surgery. In suitable cases it is no doubt best to make a free opening and drain, but much care is necessary in operating. There is danger of hæmorrhage and also of wounding the ureters. In my judgment the safest method is to select the point in the vagina nearest and most completely fixed to the abscess, then introduce an aspirating needle into the abscess to make sure of its exact location, and leaving the needle to act as a guide, make an opening with the thermo or galvanic cautery.

Apostoli's method is attracting much notice at the present time, owing, perhaps, to the fact that it is new. It is employed before and after suppuration. It may be too soon to pronounce judgment upon the method; but, while it may be of great value in promoting resolution and absorption of the products of pelvic inflammation, I do not see, in case there is abscess, how the making of an opening from the vagina by Apostoli's method, for the purpose of drainage, has any advantage over that made by the thermo-cautery as already described, and the electrolysis is much more difficult and tedious to use.

The treatment of abscesses which discharge into the rectum, bladder, or vagina, and continue suppurating, is often most difficult. The cause of the continued suppuration is due to imperfect emptying and drainage, the point of escape being above the most dependent part of the abscess.

When the abscess opens into the vagina, it is necessary to enlarge the opening, wash out the sac, and drain thoroughly, if the discharge continues. A counter-opening is very often necessary when the rectum or bladder is the avenue of escape. There are exceptions which occasionally occur. An abscess might open into the rectum at its most dependent portion, and by being completely emptied soon close and recovery be perfect. Perhaps the same results might occur when the abscess discharges into the bladder, but in many of these cases the suppuration continues until relieved by surgical aid. It is in such cases that there is an exception to the rule that I have laid down, that the opening should be made in the vagina when the abscess is low down and adherent to the vagina.

When the abscess discharges into the bladder and suppuration continues, it is far better to make the opening by laparotomy. Of course that is easy when the abscess is adherent to the abdominal wall; but even if it is not, I prefer laparotomy, and for the following reason. If the opening is made from the vagina, a vesico-vaginal fistula is formed, with a long or short sinus, and there is no tendency for it to close, and,

what is worse, being high up, it is very difficult to close by an operation after recovery from the cellulitis.

On the other hand, the vesical fistula that is made by laparotomy is sure to close in time, and generally does so before the abscess sac is obliterated. One would naturally suppose that a vesico-vaginal fistula would be much more easily managed than a vesico-abdominal fistula, but my experience has proved the reverse of this. I have had three cases of this kind, in which I did laparotomy; in one the abscess and wall of the abdomen were united on the left side, and pus had been discharging into the bladder for months. The operation was little more than opening an abscess, but the after-treatment was complicated. I had to drain the bladder and treat an accompanying cystitis. At first the urine flowed through the drainage tube most of the time, then it only came when the patient tried to urinate. At that stage of the trouble the catheter was employed each time that she desired to urinate, and then the bladder soon closed. In the other two cases the opening was made in the median line. In one I tried to stitch the edges of the abdominal wound to the abscess sac, but found it very difficult to do so. Owing to the friable state of the wall of the abscess, the stitches would not hold. I overcame this difficulty in the other case by suturing the sac wall and peritonæum together. All of these cases did well, while all cases in which the abscess opened first into the bladder and then into the vagina did badly. One such case came under my care after she had suffered from a vesico-vaginal fistula formed in this way, and I failed, after several trials, to close the fistula.

A word may be said with advantage regarding the method of operating when the abscess is not fixed to the abdominal wall. The directions given are to make the abdominal incision, open the sac, and stitch the edges of the two wounds together, and drain. This, as I have already stated, is not easy to do. When the abscess is opened its contents escape into the peritoneal cavity, and all the washing out that can be done will not always cleanse the cavity. To obviate this, the abscess should be tapped after the abdomen is opened, and then when emptied, the nearest point should be seized by two fixation forceps, one on each side of the middle, and the opening enlarged and the cavity washed out by throwing in water and pumping it out. If this is done carefully, no pus need escape into the peritoneal cavity. Then if the edges of the two wounds can be united by sutures, it is best to do so; but if, as often happens, that cannot be done, then a drainage tube should be introduced into the empty sac and fixed in the wound of the abdomen. If so far the pus has not entered the peritoneal cavity, the exudation which soon is thrown out around the tube will complete the protection by forming a fistulous tract.

I shall now give the history of some cases which will bring out more clearly some of the points referred to.

Pelvic Cellulitis ending fatally from Septicæmia.—About eighteen years ago, while in charge of the lying-in department of the Long Island College Hospital, one of my cases developed a metritis and cellulitis after confinement. The case progressed in the usual way, differing in no respect from many cases of the kind, except that the products of the cellulitis were unusually great. The metritis subsided, and the cellulitis, which was located in the left broad ligament, went on to suppuration, and, while I was looking for the abscess to discharge, the patient began to show signs of septicæmia.

There was, no doubt, a large accumulation of pus in the broad ligament, but, as we were unable by physical signs to determine that, I unwisely abstained from exploring the abscess. All constitutional treatment known to us was carefully employed, but the patient died. On post-mortem examination, a very large abscess was found in the left broad ligament, and nothing more. The peritonæum covering the abscess was congested, and there was much subserous œdema, but not the slightest evidence of any peritonitis.

This case, like many others, illustrates very well two important points: first, that cellulitis occurs without the slightest pelvic peritonitis accompanying it, and this fact tells strongly against those who make no distinction between the two affections; and, second, if this case had come under my observation in recent years, when I appreciate the value of aspiration and abdominal section and drainage, the case might have been saved.

Pelvic Cellulitis following a Hemorrhage into the Cellular Tissue.—A young, recently married lady, while very much fatigued from unusual physical exertion, was suddenly seized with acute pain in the pelvic region. When called to see her, I found her lying in bed suffering from severe pain and some rectal tenesmus; the pulse was somewhat accelerated, but the temperature was normal; the skin moist and cool. There was no constitutional disturbance beyond nervous excitation due to pain.

On examination, I found a tender point low down and to the right of the uterus; there was also a swelling which extended to the right and downward a little way, apparently between the rectum and vagina. The pain was relieved by opium, and on the following day the swelling was found to have increased and become denser, and yet there was no symptomatic fever.

Two days later the physical signs remained the same, and there was also a marked discoloration or ecchymosis of the vagina, especially in the upper and posterior part of its walls. This discoloration, taken in

connection with the history of the case, satisfied me that the case was one of hæmorrhage into the cellular tissue of the pelvis.

The pain gradually became less, but there was still a feeling of fullness and pressure in the pelvis and an annoying rectal tenesmus, which made the patient feel as if great relief would be obtained if the bowels were moved. A mild laxative was given, followed by an enema, which secured a free evacuation of the bowels; but, in place of relieving, this rather aggravated her sufferings. On the sixth day after the attack, the patient felt a little chilly, and soon afterward developed fever; there was also a slight recurrence of the acute pain in the pelvis. At this time the temperature was $102\frac{1}{2}^{\circ}$ F., and the pulse about 110.

On the day following this, an examination was made, and the mass in the pelvis appeared to be softer than it was before; but this I think was due to œdema of the vaginal walls. The fever continued for several days and then gradually subsided, and the temperature remained about 100° .

The pain and general pelvic tenesmus continued, though not in a marked degree; the patient's condition remained about the same during the following week, then the pain became more severe, the temperature rose a degree or more, and she was more restless and uncomfortable. Two days after this a discharge of pus from the vagina occurred, quite profuse at first, and continued in a modified way for a couple of days.

The discharge contained black specks, which were found to be shreds of clotted blood. Forty-eight hours after the discharge first appeared, a careful examination by the touch was made in the hope of discovering the opening of the abscess, but without success; a very careful speculum examination was then made, and by the aid of the probe the opening was found to the right and a little below the cervix uteri. The opening appeared to be just above the mass, which extended down, apparently, between the vagina and the rectum. A uterine dilator of small size was passed through the opening into the abscess sac and slow dilatation made. When the opening was sufficiently enlarged to admit a curette, a large piece of blood-clot was removed; several strands of thick, prepared silk were introduced into the opening to keep up the drainage, and during the next few days considerable pus was discharged, together with shreds of old blood-clots.

As the opening showed no disposition to close, the drainage was abandoned, and from this time onward the discharge diminished and the swelling and thickening of the tissues also slowly disappeared. Finally, the discharge stopped altogether, and thickening and induration of the tissues gradually disappeared, and complete recovery took place.

Acute Cellulitis treated by Aspiration in the Stage of Serous Infiltration (by Virgil O. Hardin, of Atlanta, Georgia).—"The patient was twenty-four years of age, and had borne a child three months before. The history of the patient showed that her menses had always been of normal character up to her pregnancy, and that she had never suffered from any symptoms which would indicate pelvic disease of any kind. Since her labor she had had tenderness of the abdomen and pain in walking and micturition. Her general health, however, had been good. On the day before I saw her she was seized with pain in the back, pelvis, hips, abdomen, and thighs. This pain was acute and excessive. Micturition and defecation became very painful, especially the latter. She had a slight chill, followed by high fever, thirst, and complete loss of appetite. When seen by me she was in bed, tossing and moaning with pain, which was referred principally to the pelvic region. Pulse 120, temperature 101°, skin hot and dry, face flushed, tongue coated. Vaginal and rectal examination were rendered impossible by excessive tenderness of the parts. The following morning she was fully anæsthetized, and a complete examination effected. The vagina was hot and dry. The cervix was lacerated on the left side. The womb was low in the pelvis, and was pushed forward against the bladder. In the posterior fornix, and occupying the whole space between the cervix and the rectum, could be felt a rounded, bulging mass, which had a boggy, œdematous feeling. By a finger in the rectum this mass could be outlined, and felt to extend upward about an inch. No fluctuation could be detected, and when pressed by the finger the mass could not be displaced upward. Considering the condition to be that of pelvic cellulitis in the stage of serous infiltration, I decided to attempt to draw off the serum from the cellular tissue, hoping thereby to abort the disease and prevent the formation of solid plastic exudation, with possibly a subsequent abscess. Accordingly, an aspirator-needle was thrust into the tumor from the vagina at three different points successively, and about an ounce in all of serum tinged with blood was withdrawn. The tumor was then found to be so softened and diminished in size as to be scarcely perceptible to the touch. A quarter grain of morphine was given hypodermically, and the patient ordered to remain perfectly quiet in bed and take only liquid diet. When seen twenty-four hours later, she had had a good night's sleep, the pain in the pelvis was almost entirely gone, defecation was no longer painful, appetite had returned, the pulse had fallen to 80, the temperature to 99°, and the patient begged to be allowed to get up. The mass in the posterior fornix could be felt only as a slight thickening. Two days later the patient was apparently in her usual health."

Pelvic Cellulitis in which the Discharge was Delayed, but finally Relieved by Aspiration.—The history of this case has nothing peculiar in it except that it progressed as cellulitis usually does, until the time when the abscess was expected to discharge. It failed to do so, and the patient's general nutrition beginning to suffer, it was deemed advisable to use the aspirator; this was done, and the abscess, which was in the right broad ligament, was emptied of about eight ounces of pus. This gave great relief; but in time the abscess filled again, and again it was aspirated; but this time, before removing the needle, the sac was carefully washed out with carbolic acid and water. Great care was taken not to inject quite as much as the quantity of pus removed, for fear that by overdistinging the abscess some thin point in the sac might rupture and cause mischief.

There was considerable reaction after this aspiration, the pulse and temperature running up, but soon subsiding again. Nothing of importance occurred in the history of the case, and she recovered in due time.

A Case of Pelvic Cellulitis; the Abscess opening into the Rectum and Long-continued Suppuration occurring in consequence.—This patient was also seen in hospital; she gave a history of having had pelvic cellulitis seven months before admission. About five weeks from the time that she was taken ill she had discharges of pus from the rectum which were followed by marked relief. After this she continued to have repeated discharges of pus in the same way; for a few days at a time she would be comparatively comfortable, though never well; then she would have a little fever, with considerable pain, and then a discharge of pus, which would give relief for a few days. These remittent attacks of pain and fever followed by a discharge of pus, continued at varying intervals up to the time that I saw her. On digital examination, I found fixation of the uterus, with evidence of induration in both broad ligaments and around the cervix, above the vagina.

She was anæmic, emaciated, and had a somewhat cachectic appearance. She was placed under ether, and a most careful examination of the rectum made. The opening from the rectum into the cellular tissue was found about three inches up the rectal wall, by bending the probe into the shape of a hook. I was able to pass it from above downward and forward, showing that the opening ran from the rectum obliquely downward into the abscess about an inch. A counter-opening was made in the most dependent part of the sac through the vaginal wall; the opening was made with the thermo-cautery. This I believe to be the best method of making counter-openings in these old cases, as hæmorrhage can be avoided and the lymphatics closed by the cautery, which to some extent guards against septicæmia.

The opening in the vagina was maintained by small drainage-tubes which completely drained the abscess. The patient improved generally and locally, and after a time the drainage-tube was given up; a little discharge continued from the opening for several days, when it closed. The case did well, and was soon dismissed from the hospital, although there still remained considerable induration and thickening of the tissues of the broad ligaments. Presuming that her recovery would be effected in time, she was dismissed from the hospital, but returned in about three months with a rectal abscess, which, when it was opened, proved to be a rectal fistula. Evidently, the opening in the vagina had closed while that in the rectum remained, thus forming an internal rectal fistula. This was treated in the usual way and the patient finally recovered.

Pelvic Cellulitis with Certain Complications, which, so far as I know, have not been noticed or described heretofore.—The patient was thirty-seven years of age, and the mother of six children. She was confined in June, and was fairly well for five days. She got up on the fifth day, and tried to attend to her housework. Four days later, while about the house, she was taken with severe pain in the pelvis, and was obliged to take to her bed again. This much of her history was obtained from the patient.

She was seen for the first time by Dr. J. H. Raymond about six weeks after her confinement, and he learned that she had had no regular medical care, and but very poor nursing, her poverty depriving her of necessary attention.

From the history and physical signs, the doctor made the diagnosis of pelvic cellulitis of the left broad ligament. The temperature at that time was nearly normal in the morning, but rose to 101° or 102° at night. There was marked constitutional disturbance, such as generally obtains in long-continued suppuration or septicæmia.

The doctor urged her to go to the hospital, but she declined until August, about ten weeks after her confinement. During the interval from the time that she was first seen until she entered the hospital she was confined to her bed with her left thigh flexed upon the body, and the leg upon the thigh. When she was admitted to the hospital she was very anæmic, had night-sweats, and had the general appearance of a tubercular patient. The flexion of the leg and thigh continued, and there was false anchylosis of the joints. The tumor in the pelvis was much smaller than it had been, but there were pain and tenderness in the left iliac region, extending up to the lumbar region. The temperature ranged from 100° to 103° , being very irregular in its rising and falling. There was no point in the pelvis where pus could be detected, and, although there was some swelling in the left side of the

abdomen, no signs of pus could be found after repeated examinations. She was able to take food and stimulants fairly well, and every means was employed to reduce the temperature and improve her strength, but without any favorable result.

Hopes were entertained that the location of the suppuration would be found, and that relief might be obtained by aspiration or other means of evacuation. In spite of the constitutional treatment, she gradually declined, the anæmia became very marked, and the temperature increased, frequently being 104° , and sometimes a fraction higher. She appeared to be doomed to die of septicæmia, and, as a last resort, it was decided to make a laparotomy, in the hope of finding the source of the septicæmia. Immediately before giving the ether her temperature was $104\frac{3}{5}^{\circ}$, pulse 140, and feeble.

The ankylosis of the knee and hip-joints was with difficulty broken up, and then a more careful exploration of the left iliac region was made. There was swelling and hardening of the wall of the abdomen on that side, but not to any great extent. An aspirating-needle was introduced at a number of points in the hope of finding pus, but without avail. The abdomen was opened, and a most careful exploration of the pelvis was made by the touch. The left broad ligament was considerably thickened and much less elastic than it should have been, showing the effect of the inflammation, which had subsided. Not the slightest sign of any point of suppuration could be found, but, by the bimanual touch, with the fingers of one hand in the abdominal cavity, and those of the other on the outside, I detected obscure fluctuation, indicating that an abscess or sinus extended along that side of the abdomen. The location of the pus having been clearly marked, the wound in the abdomen was closed, and an incision was made in the side down to the pus. It was found that the pus cavity was very small at its lower and most superficial end. It would not admit the little finger. This accounted for the fact that it was not found with the exploring needle. Passing a probe upward from the opening made, I found that the sinus was wider above, and extended up to the diaphragm. The cavity was washed out, and a drainage-tube introduced.

Dr. Palmer, who aided in the operation, conducted the after-treatment, and the following facts are taken from his record, as kept by the house-surgeon :

The patient reacted well under the effect of morphine and atropia, given hypodermically at the end of the operation and again in three hours. Whisky with hot water was given for four hours after the operation; she retained it well, and from that time onward the morphine and whisky were given to meet requirements. Five hours after

the operation the temperature was $99\frac{1}{2}^{\circ}$, pulse, 128, respiration 28. Two hours later the pulse went up to $100\frac{1}{2}^{\circ}$. The night was passed very comfortably, but she required morphine and whisky in large doses, not altogether because of the pain or exhaustion, but largely from the fact that she was used to both. For years she had been a drinker, and, during the long illness previous to the operation, she had taken morphine. At five o'clock on the following morning the temperature was 102° , but in two hours it came down to 99° .

From this time onward her progress was favorable, at times the temperature went up one or two degrees, but came down when the pus sac was washed out. She improved in strength, but the suppuration high up in the cavity continued, but in a much less degree.

Her lung-trouble progressed slowly, but she seemed doomed to pulmonary phthisis. One month after the operation there was still a little discharge from the wound, but she did not apparently suffer from that to any extent, but her cough was worse, and the lungs not improving. At this time she returned to her home. I heard that she died several months after of phthisis pulmonalis.

This one case would hardly be sufficient to establish any kind of a theory, but I have two others. One of them, the first one, came some eight or ten years before this. A woman was brought into the hospital with pelvic cellulitis; she undoubtedly had pus in the cellular tissue; she was in the stage of suppuration when she was brought in. Soon after, or about the time that she came in, there was evidence of the abscess discharging, or tending to discharge in the left side, so we took it for granted that it was one of those cases that would have to discharge by the abdominal wall. In place of going on to evacuation in the normal way, hardening and thickening of the tissues extended upwards, and by and by we opened the abscess as it appeared to point in the left iliac region, and a large quantity of pus was discharged. This gave her a good deal of relief, but we found that the abscess extended up to, if not beyond, the diaphragm; and although she got relief from this operation, she still continued to suffer; but with drainage and washing out, we were not able to make as rapid progress as we hoped for.

Previous to this time she had suffered from bronchitis and cough, and one day while we were washing out the sac, she said she tasted carbolic acid, giving the idea that there was a continuous sinus between the opening in the abdomen and the bronchial tubes. In order to prove this we stained the solution with carmine, and she expectorated carmine-colored sputum. She continued to suffer from septicæmia, and finally died. On post-mortem we found pelvic cellulitis on the left side, and that the pus had burrowed up beneath the broad ligament and

found its way into the sheath of the psoas muscle, from there along to the diaphragm, behind that along the side of the spinal column and into one of the bronchial tubes.

Prof. William Warren Greene saw the case at the time, and said that it did not appear to him to be like the usual psoas abscess with which he was familiar. He was very much interested in the post-mortem, and he said, certainly, in his opinion, it was an extension, by burrowing of pus from the cellulitis to the psoas muscle.

The other case I saw in consultation with Dr. Dickinson. The patient had ankylosis on the left side, with evidence of septicæmia. She went to the hospital and was operated upon, and pus was found in the same way, so that the history is similar to the other cases.

These three cases lead me to suppose that this is not an entirely unknown or rare behavior on the part of cellulitis, and it would account perhaps for some of the cases we have seen before, cases in which the diagnosis was made late in the progress of the disease, as psoas abscess. while the fact is that the psoas abscess is secondary to the pelvic cellulitis.

The questions which I have endeavored to present for your consideration and discussion may be stated as follows :

- 1st. That pelvic cellulitis, uncomplicated, occurs frequently.
- 2d. That sub-peritoneal pelvic hæmatocele should be recognized as one of the causes.
- 3d. That aspirating may be employed before and after suppuration, with advantage in suitable cases.
- 4th. That abscess in the cellular tissue of the pelvis should be opened from the vagina when the conditions are favorable.
- 5th. That laparotomy is advisable when the vaginal wall is not closely adherent to the abscess sac.
- 6th. That laparotomy should be made when a pelvic abscess opens into the bladder and suppuration continues.
- 7th. That cellulitis may extend to the psoas muscle and give rise to psoas abscess.

DISCUSSION.

Dr. MADDREN.—I would like to inquire whether, in those cases where the opening is into the rectum, it is possible to make a subsequent opening into the vagina, and if we do make that opening, do we, as a rule, get a recto-vaginal fistula ; are we likely to have that as a result ?

Dr. SKENE.—I am unable to state the number of cases where that has taken place ; I have no statistics on that subject, but I think it occurs in quite a number of cases. In fact, the condition is not a very

rare one, I mean where the abscess discharges into the rectum and suppuration continues. In a certain proportion of cases the abscess discharges into the rectum and that is the end of it. It will always be a favorable avenue of escape, and the recovery will be complete and prompt, under two conditions :

When the opening into the rectum is at the most dependent portion of the abscess sac ; and where the opening is from above downwards into the rectum, so that in case of the evacuation of the bowels the opening is closed ; the opening is valve-like, and as pressure comes upon the rectum during the evacuation, it closes. If it is above the most dependent part of the abscess, then it is just the reverse ; and every time the bowels act (especially if there is diarrhœa) part of the contents of the bowels will enter the sac and keep up a suppuration, so that the abscess will not empty itself, and it becomes chronic.

The cases that require a counter-opening into the vagina are liable to terminate in recto-vaginal fistula, but not always. In view of the danger of this recto-vaginal fistula following a counter-opening (I forgot to mention that in my paper, which was prepared very hastily), it has been suggested to enlarge the opening into the rectum, or convert the opening in the rectum into a rectal fistula and then drain, and trust to that healing up as a rectal fistula would, after operation. That has been suggested, and I believe practised. In September I heard that question discussed at Washington, and one claimed that it was safer and surer than the other way, but I think Thomas claimed that it was dangerous ; that in making such a large opening there was great danger of septicæmia, and I believe he said that he had seen death from this method of treatment.

REMARKS ON SOME ERRORS OF DIET DURING CHILDHOOD, WITH ESPECIAL REFERENCE TO THE EXCESSIVE USE OF CONFECTIONERY.

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Read before the Medical Society of the County of Kings, September 18th, 1888.

There can be no doubt that the future health of a child can be influenced in a marked degree by its nutrition during the years of childhood. A child born of healthy parents may be a picture of rotundity and health, or it may be, and often is, a physical wreck before the age of puberty.

A somewhat extended observation of children's diseases has led me to the conclusion that many of the cases of general ill-health and enfeebled constitutions are produced by preventable causes. Among these causes there is no one so prominent as mal-nutrition or defects in primary assimilation. I have strong reasons for believing that the foundation for many cases of pulmonary phthisis in after life, is based upon faulty nutrition of a preventable nature in early life.

There will be no dissenting voice from the proposition, that to have a healthy child we must have a well nourished one ; not merely a fat, flabby form, but one in which *all* the tissues are well nourished. Rachitic children may have stored up an abundance of fat, while the bones are very poorly nourished. The diet of childhood is of more importance to the man and woman than most people appreciate. A great deal has been written in recent years upon the subject of feeding phthisis. Forced feeding has received strong support in many quarters. Others have advocated, with good reason, the cultivation of an appetite for fatty foods ; while others urge the foods which contain the largest proportion of the phosphatic salts.

If these ideas are of any value when the disease is beginning to develop in a recognizable form, how much more should they be urged in children of consumptive parents before these symptoms have developed. Indeed, I have no hesitancy in claiming that by proper attention to the diet and other hygienic surroundings, the disease may be made to disappear from many such families. The child's appetite, digestion and food receive far less attention from the parents and physician than they should. We often forget that an appetite is capable of cultivation, and yet we can all remember cases where appetites have been completely changed by cultivation. How many persons relish raw oysters, tomatoes, parsnips, or lager beer when first tasted ? The old doctor used to speak of "working up an appetite." In health, at least, there can be no question that the appetite can be cultivated to relish almost any given articles of diet. This fact having been granted, why should we not more often advise mothers and fathers to cultivate in their children an appetite for the food best suited for growing and developing children.

Certainly, examples of poorly nourished children are common enough to emphasize this suggestion. It is my purpose to call attention to certain errors in the diet of children, which are the cause of a great deal of ill-health, because of their effects upon the digestion and nutrition. Food that cannot be digested, if put into the stomach, acts as an irritant. An irritant in the stomach at first causes an excessive flow of mucus and acid, and if continued catarrhal inflammation.

Gastric catarrh, both acute and chronic, is very commonly met

with in children between two and twelve years of age. The two chief causes for this affection are exposure to sudden changes of temperature, and improper food. Exposure to cold is undoubtedly a very prominent factor in the production of acute gastric catarrh in some children. But the cause is more frequently to be found in the quantity or quality of the food taken. It is especially to this cause that I intend to call your attention. Acute gastric catarrh is more frequent in children than in adults. The attacks come on rather suddenly, frequently beginning with a chilly feeling or a distinct chill. This is followed by a rise of temperature. The thermometer will frequently rise to 105° F. and the pulse at the same time become very rapid. There are always very marked nervous disturbances, sometimes culminating in convulsions. There are frontal headache, restlessness, delirium, an offensive breath, a dry coated tongue with the red swollen papillae projecting through it. The tip of the tongue is sometimes fiery red and not coated. The appetite is entirely lost, and there is considerable thirst. Vomiting is not common but may occur. The complexion is sallow, and there are dark circles under the eyes. The expression is one of languor rather than one of distress. The behavior is restless and peevish at night with disturbed dreams, the child often awaking in terror, or is languid during the day. The rigors may return two or three times a day, or only on the approach of evening, and are followed by fever. The attacks may last from 3 to 6 days, when the appetite returns, the pyrexia subsides, the spirits brighten and the child is convalescent. In some cases the catarrhal inflammation passes into the duodenum, and into the *ductus communis choledochus*, accompanied with mild jaundice, and sometimes to the small intestine, giving some pain and diarrhoea. From the fact that these attacks are frequently accompanied by slight rigors, they are not infrequently mistaken for malarial infection and the recovery is delayed by large doses of quinine. A child after such an attack may recover and have no return of it.

Frequently, however, other attacks follow, perhaps of a milder type, commonly known as bilious attacks, lasting two or three days. There is very little fever except possibly at night, when the child is very restless, has "night terrors," loses the appetite, mopes or lies about during the day, has a pasty or sallow complexion, etc. These mild attacks of temporary catarrh often become so frequent as to seriously interfere with the nutrition of the child. It becomes anæmic, with dark circles under the eyes, emaciates, has an habitually poor appetite, is unable to eat hearty food and craves delicacies, often soliciting very indigestible articles such as pastry, confectionery, bananas, etc. As the emaciation, palor, and general bodily ill-health increase, the nervous system becomes irritable or precocious. Such cases are often

supposed to be cases of consumption, and if there be hereditary taint, I have no doubt that the long continued lack of proper nutrition may go a great way toward developing the tubercular disease.

I have frequently observed tubercular peritonitis and meningitis in such subjects which I have thought may have developed because of the long continued lack of nutrition. We frequently see such children growing up into mere physical wrecks, barely able to earn a livelihood because of a continued feeble digestion. They are pale, spare, nervous, of little endurance, and totally unfit for hard physical or mental exertion. According to my own observation girls are more subject to such affections than boys, and in them these affections are harder to overcome.

In a child which is subject to these so-called "bilious attacks," a very slight exposure to cold, or indiscretion in diet will precipitate an attack. There is no doubt in my mind that the most important etiological factor is improper food. By improper food I mean indigestible, irritating and easily fermentable food. Almost all food if not thoroughly and quickly digested and absorbed will undergo fermentation in the intestinal canal. The three forms of ferment always present in the digestive canal are the alcoholic, the lactic and the butyric.

The substances acted upon by the alcoholic or yeast ferment are the sugars. This fermentation takes place very readily in slightly acid fluids; hence, it may take place in the stomach. Glucose, maltose, and invert sugar are the most easily fermentable under the action of yeast. As the inversive ferment is produced in the intestinal glands, there is little liability of saccharose, or cane sugar, undergoing the alcoholic fermentation in the stomach. Glucose, grape or fruit sugars and maltose, on the other hand, readily undergo the alcoholic fermentation in the stomach. We should expect, therefore, more fermentation from foods containing glucose than from those containing only cane sugar. Confectionery which contains glucose ought to develop more trouble from fermentative processes than rock candy or other kinds made without glucose.

The alcoholic fermentation, however, does not give rise to serious consequences as a rule. There are other ferments which are much more important. I refer to lactic, butyric and putrefactive ferments. These processes are, even in a state of health, continually in progress within the alimentary canal. They are pathological when they become excessive. The first two then give rise to what is termed acid dyspepsia. The last gives rise to production of what may be termed bowel dyspepsia with flatulency, diarrhœa, etc.

The continual presence in the stomach and intestines, of an easily fermentable substance like glucose, mucus and peptone, by furnishing

suitable pabulum encourages the growth of lactic and butyric ferments. These fermentations take place most readily in nearly neutral or slightly alkaline solutions containing mucus, the glucoses and saccharoses, organic acids and soluble albuminoids, and at about the temperature of the human body. The readiness with which the lactic fermentation sets in with these substances is about in the order in which they are named.

Some of the saccharoses undergo the lactic fermentation quite readily, as for example milk sugar; while others ferment with difficulty. Those which feed the alcoholic ferment most readily, are with the greatest difficulty transformed by the lactic, and *vice versa*.

Butyric fermentation is usually associated with the lactic and follows it. It very readily attacks lactic acid, sugars, especially the glucoses, starchy matters, tartaric, citric, malic and mucic acids, and albuminous matters in a state of ready decomposition. The albuminoid matters are essential to the growth of both the lactic and butyric ferments. Although these ferments grow most readily in neutral or alkaline liquids, they will grow in acid solutions, up to a certain limit of acidity, when once established. The conditions furnished by a highly saccharine diet, therefore, favors the rapid growth of yeast in the stomach and of lactic and butyric ferments in the stomach and upper part of the bowels.

Such a diet will sooner or later develop these processes with all the vigor of which they are capable, and with the production of all the evil effects they are capable of producing. Of the evil effects of alcoholic fermentation in the stomach, if any, we are not certain. Of the effects of acid fermentation in the stomach we are certain.

Excessive acidity of the gastric juice checks the digestion of albuminoid or protein substances, whether it be due to hydrochloric, lactic, acetic, or butyric acids. Here we are called upon to distinguish between *hypersecretion*, due to irritation of the mucous membrane by indigestible food, and *excessive acidity* the result of fermentative processes. If we test the vomited acid fluid of certain attacks of so-called "biliousness," we find at one time that hydrochloric acid is in excess, and at another the organic acids.

The effects, in either case, are to check the digestion of albuminoids, produce gastric catarrh, to increase the secretion of mucus, a body which most readily undergoes lactic and butyric fermentation, and thus keep up the trouble. Whether the first cause be irritating food or easily fermentable food, or both, the result is gastric catarrh.

The excess of acid here referred to, if it does not excite vomiting, as it is likely to do, passes into the duodenum, along with the partially digested food, where it is met by the alkaline bile and pancreatic

fluids. The neutralizing effect of the acids prevents these fluids from exercising their full normal action upon the fats and perhaps also upon the starchy matters.

The fats at least are not properly saponified, emulsified, or absorbed. Emaciation follows as a natural consequence. These children generally avoid fats because they disagree.

As a result of the loss of nutrition, and the constitutional effects of the excessive amount of acids absorbed by the blood, nervous disturbances are generally seen. These nervous symptoms, such as neuralgias, frontal headache, sleeplessness, night terrors, delirium at night, etc., are akin to the well-known nervous symptoms of the uric acid and gouty diatheses of adults.

To the effects due to excessive acid must be added those due to the absorption of various side products or ptomaines generated by this depraved, abnormal digestion. These substances probably produce many remote disorders of nutrition leading to a condition of debility and exhaustion.

Again, the highly acid fluid containing the imperfectly digested food, passing from the stomach into the duodenum, excites more or less catarrh of that part of the intestine. The discharge of the bile is interfered with, and the skin assumes a sallow or earthy complexion. There is a feeling of uneasiness in the epigastrium or lower down in the small intestine. This condition of affairs may continue under the continued use of indigestible and fermentable food, until it excites an attack of vomiting of acid mucus, followed by yellow and finally green bilious matters. Such an attack is easily brought on, in such children, by any indigestible article of food, or by an indulgence in sweets. These attacks finally succeed one another so often that the health of the child becomes a matter of great concern both to the physician and parents.

Thus far we have considered only the effects of disordered digestion as they are seen in the stomach and duodenum. It must be remembered that the digestive process is not completed until the food has passed through the entire small intestine. The undigested albuminoids, passing into the intestine, still in a state of active fermentation, yield no inconsiderable quantities of hydrogen, carbonic dioxide, nitrogen and sulphuretted hydrogen gases, causing painful distension of the intestine. Ordinary putrefactive bacteria here flourish, with the production of various more or less poisonous products, some of which have laxative properties, and frequently produce active diarrhœa.

Others exert their influence upon the circulation or nervous system to produce depression or irregularities of the heart, vertigo, a scarlatina-like eruption, dryness of the fauces, frontal headache, etc.

The gases escaping by the mouth and rectum have an unusually offensive and sickening odor.

The cause of the high temperature in ordinary bilious attacks is not easily explained. But it is probably partly of nervous origin, and partly due to poison developed by the perverted digestion. The poison theory of these fevers is given strength by the fact that a cathartic lowers the temperature. Not only in the disorders of the digestive canal do we see this fact illustrated, but in pneumonia, typhoid, and indeed in most of the fevers. Upon this subject Brunton remarks: "No one who has watched cases of acute disease such as pneumonia can have failed to see how a rise of temperature sometimes coincides with the occurrence of constipation, and is removed by opening the bowels."

We are all familiar with the effects of excrementitious poisoning. Bouchard separated from normal fæces a substance which, when administered to rabbits, produced violent convulsions. Brieger and others have found poisonous substances produced by ordinary putrefaction of proteids. From a large number of facts we are warranted in assuming that the poisons generated by fermentative processes in the intestine cause many of the bad effects seen in cases of chronic dyspepsia.

We have not the time to follow out all the train of symptoms occurring in such cases. Enough has been said to emphasize the fact that grave disorders of nutrition can be produced and kept up by the indiscriminate use of saccharine and indigestible food.

I am aware that various committees and experts have reported that glucose, as an article of food, is unobjectionable. I am also aware of the fact that cane sugar is transformed into glucose and levulose in the intestinal canal.

Scientific gentlemen tell us that glucose makes as good a malt beverage as malt; nevertheless, the testimony of several brewing masters in this city is that it does not. It is claimed by these competent witnesses that the after effects of drinking a beer made with glucose are bad. The headache, feeling of languor, obtundity of mental faculties are more pronounced in the case of glucose beer. The fermentation of artificial glucose is undoubtedly somewhat different, as to the accessory products which are formed during the process, from that of malted barley.

Sometime ago an attempt was made in France to cheapen the production of wines by adding glucose to the juice before fermenting. The experiment was a failure according to the published report, on account of the unpleasant after effects of the wine upon those who drank it. I have for sometime been convinced that modern confec-

tionery made with a mixture of glucose and cane sugar is more detrimental to the health of children, at least, than rock candy or pure cane sugar candy. The reason of this difference I have tried to account for in this paper. Whether this explanation be the correct one, or whether or not our modern mixtures are more deleterious than the plain cane-sugar candy, there can be no doubt that it is deleterious to most children when used freely.

When gastro-duodenal catarrh is once established, any form of sugar or even starch will serve to aggravate or continue it.

In the *treatment* of chronic gastric catarrh, in children, the exclusion of all forms of sugar is essential to success. I have seen cases recover perfect health with no other treatment but the exclusion of sweets, nuts, bananas, pastry, etc. During the progress of this treatment I have seen small pieces of apple pie produce the most violent attack of acid green vomiting, requiring a week's treatment to subdue.

It is generally necessary to administer some form of anti-fermentative. I have usually found sodium benzoate, sulphocarbolate or salicylate dissolved in glycerine, together with a little calomel, to be of great service in the beginning of the treatment.

The most important part of the treatment is the preventive. The practice of allowing children to eat candy frequently and whenever they ask for it is to be prohibited. This remark I wish to apply to well children, as well as to the sick. Especially should we use all our influence against the practice, so common in our cities, of allowing children to have pennies with which to buy what their fancy may dictate.

There are usually associated with sweetmeats, certain very indigestible articles such as peanuts, almonds, walnuts, cocoanuts, etc. In most candy stores are sold diabolical mixtures known as peanut taffy, cocoanut taffy, etc., which for children contain more mischief to the cubic inch than any other article of diet the markets afford. I have often felt that the health authorities would be justified in forbidding the sale of these mixtures as detrimental to health. The practice so common in cities of giving pennies to small children with which to buy whatever they may find on the stand of the street vendor, or in a candy shop, is doing more to undermine the health of our children than any other one thing I know. Although it does not directly endanger life, it leads to a lower vitality, which makes the children an easy prey to all kinds of intercurrent troubles. When a child suffering with chronic gastro-duodenal catarrh contracts any serious illness, it becomes a serious question to sustain the vital powers, because of the failure of digestion. When no such accident overtakes these debilitated victims of the penny, they grow up with a permanently de-

praved digestion, an irritable nervous system, little endurance, and thus greatly at a disadvantage in the battle of life. If American cities were not being continually replenished with a foreign population and recruits from the country, the deterioration of our population would be much more evident.

A very large proportion of the sturdy men of the cities of to-day came from the country; while the children of affluence very often find themselves unable to stand the strain. Of course other influences are at work to bring about the result, but I believe that diet has an important place.

Is it not time that physicians should raise a warning cry against this increasing evil of excessive candy eating.

DISCUSSION.

DR. HOPKINS:—I am sorry that I was able only to hear the closing portion of Dr. Bartley's paper, and I think the community and the Medical Society are more indebted to Dr. Bartley for the investigations he has made in this line than to any other man in the City of Brooklyn. He has been the pioneer in looking after our food, and at great inconvenience and expense to himself personally, without compensation; and anything that comes from his pen is always read by me with pleasure.

There is one subject brought up incidental to this question, the question in regard to chewing gum. I should like to say a word on this subject, if it is not out of order.

In regard to this filthy, disgusting habit, I have very strong feeling, and I believe that more dyspeptic troubles among young girls, and especially young women of about 16 years of age, have been produced by this gum than we can well imagine. I have had one young lady almost at the point of death, and solely from the use of gum. These young women have the habit of swallowing it. They will chew it for a while and then they will swallow it. I don't know what they do it for, but they do it. And I suppose my friend Dr. Bartley was a little chary about sitting down on gum, because the New York Board of Health has recommended it, and through Dr. Edson has upheld it. I believe it is very injurious. A certain amount of saliva intermixed with the food as it passes into the stomach of course is desirable, but the drowning of the stomach with the amount of secretion generated and swallowed under these circumstances is injurious. Of course, a lady or a girl does not like to spit, and she will swallow the saliva. We all know that a man will spit. And often this accounts for their not eating any breakfast the next morning after chewing gum the night before.

We sit in a car, and women, whom we call ladies, will sit opposite us and chew, chew, chew, and it is exceedingly disgusting to watch them.

I want to put myself on record as against this pernicious habit of chewing gum, and I hope this Society generally will put its foot on it and try to stop it. It is doing more injury than candy, and even bad candy at that.

A CASE OF HIGH TEMPERATURE FOLLOWING PARTURITION.

BY HENRY N. READ, M.D.

Clinical Professor of the Diseases of Children, Long Island College Hospital.

Read Before the Medical Society of the County of Kings, October 16. 1888.

Mrs. H. B., æt 24, primipara, was taken with labor pains on the morning of April 19th, 1888. On my arrival I found only slight dilatation of the os and feeble pains. Patient continued throughout the day about in this condition, and at 10 P. M. the membranes ruptured and the pains grew stronger. A head presentation was recognized in the first position. There was nothing remarkable about the case; the pains, though frequent, were rather inefficient, and after a tedious labor, the head having reached the perinæum, chloroform was administered and the forceps applied at 5 o'clock A. M. of the 20th. The child was delivered very easily, weighed about seven pounds and was vigorous. No laceration took place or any unpleasant complication. There was rather profuse hæmorrhage, but it was easily controlled. The mother made an excellent recovery from her confinement, had an abundant supply of milk for her baby, and exhibited no unpleasant symptoms of any kind, an agreeable surprise to me, rather, as she was quite anæmic in appearance, and had suffered from considerable general œdema during her pregnancy. In fact, I had treated her before her marriage for a very obstinate attack of chlorosis, accompanied with œdema and deranged menstrual functions, and though after some months of treatment the affection had yielded, she had never regained entirely her healthy looks though she was apparently quite well. On the tenth day after delivery she was allowed to sit up, and I saw her at midday, when she had eaten a good dinner and was nursing her baby, very happy in her new role of mother. I was sent for in great haste that evening about 8 o'clock, and found my patient in a high fever, bathed in a profuse sweat and quite delirious. I was told that she had sat up part of the afternoon, and about six o'clock had complained of

feeling chilly ; in a short time she had a violent rigor, teeth chattering, etc., which was followed by the fever, and in a short time she became delirious. She had had a movement of the bowels shortly before six o'clock accompanied with some pain and straining. It may be stated here that the bowels had acted freely during her lying-in, and had given no trouble. An examination of the patient showed no pain or distension over the uterus or bowels, pressure was well borne, and the lochia still continued uninterrupted. A vaginal examination showed the uterus, os, and adjacent parts to be in the usual condition of the tenth day after confinement. Her countenance was anxious, respiration hurried and pulse rapid, 140 per minute ; temperature 104.4° . As remarked, she was highly delirious, seemed to dread some impending danger, and begged those around her to save her. She was, too, drenched with sweat, the bed being, underneath her, as if a pail of water had been poured over her. In the absence of any local inflammation, I at once suspected septic infection, but was at a loss to account from whence it came, or its cause in any way. Measures were taken to counteract the effect of the poison, reduce the temperature, and quiet the patient as far as possible. Free irrigations of the vagina of a warm antiseptic solution were frequently used, and a quarter of a grain of morphia with fifteen grains of antipyrine were at once given by the mouth. The patient's body and limbs were rubbed with dry mustard, vigorously and often, to check the sweat and promote peripheral circulation. The temperature was reduced to 103° by midnight, but the pulse continued feeble and rapid, and the patient, though quieter, had not slept. Fifteen grains of quinine were now given by the mouth, and iced champagne given quite freely, about an ounce at a time. I saw the patient early the next morning and found no improvement in her condition except that she was rational. In spite of fifteen grains of antipyrine, with another quarter of a grain of morphia at 5 o'clock A.M., at 8 o'clock the temperature was 104.5° . The treatment was vigorously prosecuted throughout the day—antipyrine and morphia, followed, when a fall of temperature took place, by large doses of quinine, the free use of stimulants, with dry rubbings and sponging with alcohol and belladonna tincture, all seemed to have no effect whatever in checking the course of the disease. At 12 o'clock M. the temperature was 105.5° , at 4:30 o'clock P. M. it was 106° . The drenching sweats continued, the mind was tolerably clear, she alternately dozed or was extremely restless, and the stomach which heretofore had retained everything now began to show symptoms of rebelling. At 7:30 o'clock P.M. I again returned to my patient, and was met by the nurse with the appalling intelligence that the thermometer registered 108° . I at once tested the temperature with my own instrument, and found the same

result that the nurse had with hers. The pulse was 160 per minute and all the before-mentioned symptoms were intensified. She had endeavored to have an action from the bowels, but had been unable to accomplish it. I thought at this time that I detected a slight fecal odor from the exhalations of her body. The lacteal secretion had entirely ceased. Dr. Wm. Wallace and Prof. J. A. McCorkle were hurriedly summoned to consult with me, and to my great gratification responded promptly, arriving at the bedside about 9 P. M. The case was carefully gone over, and the diagnosis of septic infection was made and a very unfavorable prognosis given. No symptoms of peritoneal or uterine inflammation were to be observed, though looked for carefully, and I then essayed a vaginal examination. To my surprise I found that my fingers, though well oiled, would not enter the vagina. The introitus seemed to be occluded by a firm mass pressing against the left side of the vagina. Passing my hand down and underneath the left buttock, I found a large swelling occupying this part. The patient was at once placed on the right side, and the lower part of the body exposed for examination. No sooner were the bed clothes thrown back from the nates, than the puzzle was solved at a glance. A huge ischio-rectal abscess had formed, which entirely occluded the anus and rendered the entire buttock red, swollen and brawny. Fluctuation, deep but distinct, was detected in the ischio-rectal fossa. Intense hardness and heat were communicated to the sense of touch, but, strange to say, the patient complained of no pain on handling or pressure. No doubt now remained in the minds of my counsel and myself, that the abscess was the cause of the infection, and as little doubt was expressed as to the treatment which should be pursued. The only fear expressed was that the tremendous fever of the preceding twelve hours might have done irreparable damage, either to the nerve centers or to the muscular structure of the heart and that the patient might not be able to rally even though relieved. Without waiting to use any anæsthetic, either general or local, I immediately made an incision with a curved bistoury, about two and a half inches long by one inch deep, cutting through the hard tough tissues into the heart of the abscess. A copious discharge of fetid fecal-smelling pus followed, accompanied with a loud report and a large evacuation of the gaseous liquid and solid contents of the bowel, which distributed itself with great impartiality over my face and person, as well as over that of one of my distinguished colleagues, much to his disgust. About a pint of horribly odorous pus was evacuated from the opening, and in a short time the patient expressed the greatest sense of relief. The large amount of the discharge from the bowel was due in part to an enema which had been retained from the evening before. This had doubtless given rise to the contin-

ued desire to evacuate the bowel, while the abscess had prevented its occurrence. Within an hour the temperature fell to 105° , 3° in an hour. A pledget of carbolized lint was inserted into the lower angle of the wound to drain it, the patient made comfortable and a quarter of a grain of morphia administered. She fell into a quiet sleep and had a comfortable night. I remained through the night with her and took the temperature at intervals. By 7 o'clock A. M. the next day the thermometer registered 103° , a fall of 5° in nine hours. The next week was an anxious one. The temperature continued between 102° and 103° , but the wound discharged freely, and by the free exhibition of stimulants and nutriment, and by careful nursing the patient gradually rallied. At the end of the third week, as she was getting along very encouragingly, symptoms of phlebitis manifested themselves greatly to my alarm, as the patient was much reduced. The appearances were located in the right leg, the side opposite to the one in which the abscess occurred. These were, however, successfully combated, and after a long and tedious convalescence, she left home, about the middle of July, for the country, three months from the day of her confinement. Since her return I have seen her and found her well and hearty. She informed me after her recovery that she had had some trouble about her rectum two years before her confinement, and supposed it to be piles. She consulted a physician about it, and he, after an examination, told her that she had an abscess at the anus, and advised poulticing preparatory to opening it. She applied the poultices for several days, and the abscess entirely disappeared, so that no lancing was necessary; but since that time she had at intervals, especially when constipated, noticed a small lump near the margin of the anus. It is probable that this spot was the origin of the ischio-rectal abscess; that the original abscess had not been entirely absorbed, but left a nidus of inflammatory material, which subsequently was lighted up during the puerperal period.

The first interesting point about this case is the rapidity with which this mass developed. I made a vaginal examination on Sunday night at 8 o'clock and there was nothing there perceptible to the touch, and the next night at about the same hour I was unable to introduce my finger into the vagina; certainly a very remarkable development in point of time as well as in point of size.

Another interesting point is the fact of recovery from a temperature of 108 degrees. I believe recovery from a temperature of this degree is extremely rare; some cases of sun-stroke have been reported, but I have not been able to find any others. I have no doubt the height of the temperature was due to pyæmic infection, and not only to that but also to fecal absorption.

The presence of this abscess prevented the escape of fecal matter from the bowels and caused some of it to be absorbed, as well as some of the pus in the abscess itself.

DISCUSSION.

DR. SKENE :—When you called for remarks on the other paper, mine, Mr. President, a neighbor intimated to me that evidently the members did not consider it a *remarkable* paper, but I can say that that does not apply to Dr. Read's paper.

I simply rise to ask the Doctor a question, and that is, is he perfectly certain that inflammatory action was not going on higher up than he was able to reach on his examination on Sunday night. I ask the question because it would be very remarkable if an abscess so large, and where there was such extensive suppuration, should develop in so short a time. I can readily understand that inflammatory action and suppuration might be going on sufficiently high up to be beyond the reach of the diagnostician. If that was not the case, then it would be a very rare case, and yet not unheard of, because extensive inflammation of the cellular tissue and suppuration will take place in a very short time indeed.

I would also like to say that there is always a very interesting question that comes up in this connection, the question as to why in some cases we get septicæmia from inflammation in the cellular tissue or elsewhere, in such a marked degree, while in another case where there are quite as marked local lesions and suppuration, we get scarcely any septicæmia. I suppose it is because in one case the abscess is walled in thoroughly and so the system is protected; whereas in a rapidly developing inflammation, post-partum, where the vessels in the pelvis are large, if that inflammation and suppuration occur before this process of protection by exudation takes place, then we can see how septicæmia would be likely to occur in the way it does. On the other hand in slowly developing abscesses the protection is perfect and the constitutional disturbance is very slight indeed. I had satisfied myself that that was the explanation, and that in rapidly formed abscesses we might always expect septicæmia, and that if the progress of the trouble were more slow, and the protection more perfect, we might not. But I found a case of high temperature which occurred in a case of the slowest development. I saw the case with Dr. Jewett, and it was a question whether there was suppuration, and yet that patient suffered from septicæmia for weeks or months, having a temperature of 106° , if I remember rightly, at times. That case upset my theory of the difference between the behavior of rapid and slow inflammatory attacks, occurring post-partum.

Can anybody explain why we have it in some cases post-partum and not in others?

DR. READ :—Mr. President, in replying to Dr. Skene, I would say that I am perfectly confident there was no trouble going on higher up, or very little at least. The examination which I made on Sunday night, when I saw the patient was a very thorough one. I palpated the uterus and felt around in all directions, around the vagina—it occurred to me there might have been some sudden rupture of something and absorption from that—but I did not examine the upper portion around the bowel or the termination of the gut in that direction. No doubt the trouble was going on at that time, but the abscess was not of sufficient size at that time to attract attention by the introduction of the hand into the vagina. If I had felt around the anus I might have felt the commencement of it, but I am pretty certain it had not attained much size at that time. I had the idea at the time that the very rapid appearance of the septic symptoms was due in part to the patient's general symptoms.

DR. JONES :—I would like to ask the author of the paper if there were any symptoms developed in the case indicating a septic peritonitis?

I recently saw an operation performed in a case which illustrates the deceptive symptoms occurring in cases of peri-rectal abscess. In this case the symptoms had been constipation with rapid septic symptoms, and the operator thought that he had a case of peri-typhlitic abscess, or some trouble in that region. Laparotomy was performed, a section being made in the median line. As soon as the peritonæum was opened, purulent serum and flaky masses of lymph and pus were found agglutinating the intestines. The vermiform appendix was found in a healthy state, except some general congestion of the peritoneal surface.

On separating the coils of intestines and seeking deeper in the pelvis, a tumor presented itself at the lowest portion of the pelvic cavity. An aspirator was plunged in and a few drops of pus drawn off, which was exceedingly offensive. The sac was then emptied with a trocar, the peritoneal cavity being protected by flat sponges, a glass drainage tube was passed into the opening in the sac and the pus thoroughly evacuated. The tube was left in the sac and came through the abdominal wall, and in the dressing this region was protected from the rest of the peritoneal cavity by iodoform gauze.

I afterwards learned the patient made a good recovery.

My question was suggested by a remark made by Dr. Skene, that

the abscess might have had its origin higher up than the ischio-rectal fossa.

DR. READ :—I believe anatomical reasons will answer that question. The arrangement of the pelvic fascia would not allow pus, formed in the broad ligament of the peritoneal cavity, to find its way into the ischio-rectal fossa.

In regard to the sudden occlusion of the vagina, I may say that irrigations of the vagina were used throughout the second day, also by the nurse, and she had not noticed any occlusion of the vagina until the afternoon of that day. So the kindling up of the abscess must have been very sudden. I have very little doubt that its origin was the original abscess which was there some two years previous, and which was not entirely removed. I am very certain there was no inflammation higher up in the attachments of the uterus or peritonæum.

OBSTRUCTION OF LARGE INTESTINE.

BY JAMES F. FEELY, M.D.

Read before the Brooklyn Surgical Society, March 15th, 1888.

A young man, twenty-four years old, had an attack of peritonitis on February 6th, 1888; by the 18th of same month he had so far recovered that I ceased to visit him. He regained his usual health; bowels moved daily. On the evening of May 18th, 1888, I was asked to see him. Found him lying on a bed, with his knees drawn up and holding them with both hands, and complaining of great pain in the abdomen.

On closer examination I found the pain to be in the left lumbar region, the whole abdomen swollen and resonant on percussion. He said that he was enjoying his usual health up to the time he took lunch; while at table he was seized with a sharp pain in the left side of abdomen, and vomited. Pulse 98, temperature 100° F.; vomited while his temperature was being taken. Ordered hot poultices to abdomen, and to take one-eighth grain of sulph. morph. every two hours if pain continued. Visited him at 7 A. M. on morning of 19th. No pain, abdomen swollen, pulse 80, temperature normal; vomited once through the night, and has a "sick stomach" at time of visit; has taken two doses of the sulph. morphine. Stopped morphine and

directed that the poultice be continued; as little to be taken into the stomach through the day as patient could get on with. Visited him at 10 o'clock, P. M. He has not complained of pain, says he has not any at present. No vomiting through the day, but is stomach-sick; has passed water freely (urine normal throughout sickness). Temperature and pulse same as morning.

20th, 7 A. M.—Has vomited once through the night, but does not feel so sick at stomach as before vomiting. Pulse 72, temperature normal. 10 P. M.—Abdomen much distended; pulse 72, temperature normal. Injection. Nothing returned but injection.

21st, 7 A. M.—Large coil of distended intestine is seen through abdominal wall in the left lumbar, extending into the left inguinal region. On handling the tumor, it disappeared with a loud gurgling sound. No tumor can be found by palpation of abdomen or examination per rectum. Pulse 68, temperature normal. Injection. No result. 10 P. M.—Temperature normal, pulse 68.

22d, 7 A. M.—Pulse 68, temperature normal. Has passed wind freely per rectum. Injection. No result. 10 P. M.—Pulse 68, temperature normal.

23d, A. M.—Pulse 68, temperature normal. P. M.—Pulse 70, temperature normal.

24th, A. M.—Pulse 70, temperature normal; bowels moved with injection. P. M.—Pulse 72, temperature normal.

25th, A. M.—Pulse 72, temperature normal.

Bowels moved without injection, 26th, 27th, 28th, 29th. Nothing to note. Ceased to visit him on the 29th.

I report this case to the society, hoping that the discussion will bring out the views of the members as to the proper time for operation in cases of obstruction.

DISCUSSION.

Dr. PILCHER.—As I understand it, Mr. President, the question presented to us by Dr. Feely to discuss is, what are the symptoms which indicate that an obstruction of the bowel exists that cannot be overcome by medical measures, and how early in the case when these symptoms declare themselves should surgical measures for its relief be instituted?

This is a broad question and one that involves a great many considerations; one about which the widest divergence of views can be held by men, to support which most excellent arguments and unquestionable experience can be adduced on either side. There is but one single symptom which undoubtedly indicates absolute obstruction of the bowels, viz., that of fecal vomiting. It is the combination of

symptoms, and their persistence, from which an opinion is to be formed, as a rule. A second probable symptom would be that of prolonged constipation associated with persistent vomiting, not necessarily fecal, but prolonged constipation not overcome by means of catharsis, associated with vomiting. A third symptom to be taken in connection with these cases is that of manifest shock and pain. Cases of obstruction will have these various symptoms presenting themselves sooner or later, more or less marked, varying much in the respective degrees that they may present. Every case, then, must be a case to be studied by itself. It seems to me that it is a matter that cannot be reduced to absolute dogmatic rules. I take it as a cardinal principle in both medicine and surgery, that we shall do our patients no harm; therefore, that we should not proceed in the use of ordinary medicinal measures, when by so doing we are apparently increasing the severity of the symptoms that are presented. Now as to how soon surgical interference should be instituted, of the cases of absolute obstruction that have presented themselves to my own observation, in none of them has there been any question in my mind, almost from the first, as to the necessity of surgical interference, so marked were the symptoms of general systemic disturbance, so evident was the gravity of the trouble from the first. In illustration I may recite a recent case.

It is two weeks now since I was called to see a case which was described to me as one of obstruction of the bowels that had lasted for ten days, during the last two or three days of which there had been fecal vomiting. At the time that I visited the patient her general condition was apparently good; there was no elevation of temperature; there was no pinched expression of the countenance; no apparent shock; mental condition was good, and yet there had been a persistent constipation for ten days with pain referred to the centre of the abdomen, the region of the navel, and for three days fecal vomiting. There was no doubt about the diagnosis of absolute obstruction. Fortunately, however, the investigation which I was able to make brought me very quickly to a conclusion as to the cause of the obstruction, for in the groin I found a small tumor which I pronounced a strangulated femoral hernia. Upon incision, an adherent omental mass, together with a small kinkle of strangulated intestine was revealed. The gut was liberated, and the patient made a happy, speedy and perfect recovery; nevertheless it was a case of intestinal obstruction all the same. I adduce it to show that there may exist obstruction of the most serious character for so long a time without symptoms which were sufficiently grave to threaten dissolution, and which when once relieved permitted recovery to take place.

In the case which has been submitted to us by the writer of the

paper of this evening, while there was an apparent acute obstruction, which from the history I should say was probably a volvulus, the immediate pain being very great, and yet there being no elevation of temperature, no quickening of the pulse, no fecal vomiting, the general conditions at no time becoming such as to indicate a threatening condition as regards the vital resources of the patient—the course which was adopted was evidently the wisest one.

Of course it would be possible to go on and give various cases illustrating the various combinations of symptoms which may present themselves, but I will not do that. I will content myself with saying that my own conviction is that when, from the peculiar combination of symptoms which a patient presents, we can arrive at a conclusion with a reasonable degree of certainty that there is a condition of obstruction which either immediately or soon will threaten the life of the patient, that then is the time to interfere. And when we shall arrive at that conclusion must depend upon the personal judgment in each individual case. I think it ought not to be deferred, however, until the case has become a forlorn hope. We are more in danger by deferring interference until the vital resources of the patient have been exhausted, so that our effort at interference finally is simply the last straw that breaks the camel's back. I saw a most admirable illustration of this in a case last winter, where day after day the interference had been deferred, until finally it was determined upon. Laparotomy was done; yet, although the obstruction was overcome, the placing of the final superficial sutures in the abdominal wall was done *post-mortem*. Such is likely to be too often the case if we defer our interference too long.

Dr. LEWIS.—I do not know whether the Society remembers the discussion which was had after a paper which was read here some time ago. I said at that time that it did not seem to me that there had been formulated as yet any definite rules in regard to the subject. I do not think there are any such rules, and that, so far as I am familiar with these cases, every case is a law unto itself. I do not think any definite indications can be laid down. I think it is a matter which will require much time and experience, and the reports of many cases brought together, before we can formulate a set of rules or indications as to when it is best to operate and when it is best not to operate.

Dr. FEELY.—There is no question about it where the symptoms are positive. The only thing is, how long a time we should wait for these positive symptoms. There seems to be no particular rule about it, and the patient's apparent condition will not always guide you. Cases of hernia will run along without much pain, with no elevation of temperature, the patient doing well apparently, and yet there is very serious

trouble going on with the intestine. We do not wait for fecal vomiting in hernia.

CASE OF SEBACEOUS CYST OF THE GROIN.

Dr. ROCKWELL then presented a photograph of a case taken at the moment of operation, with the following history :

A woman had been brought to his office by a physician, who supposed her to be suffering from inguinal hernia, but was not quite satisfied with the diagnosis. On examination, a tumor, which had been slowly developing for two years, was found in the left inguinal fold, where it lay parallel to Poupart's ligament, which it directly covered. It was about nine inches long and two or three inches in diameter, looking like a large sausage. It had never been reducible nor had it given any pain. Impulse on coughing and resonance on percussion were wanting. The finger could readily be passed under the tumor and into the inguinal canal, outside of the tumor's wall. It was flat on percussion, and gave the impression of containing fluid or colloid material. A diagnosis of cyst was made, and on opening the tumor at the time of operation, it was found to contain about half a pint of fluid rendered semi-solid by the presence of enormous quantities of cholesterin crystals, though little or no true sebaceous matter was found. It was probably a sebaceous cyst modified by location and pressure to its peculiar shape. The sac was dissected out, and the patient rapidly recovered. The case was of interest from a diagnostic point of view, as it might easily have been mistaken for one of femoral hernia pushing up over Poupart's ligament, or hydrocele of the round ligament, both of which it resembled in many of its clinical features.

PATHOLOGICAL CHANGES IN CHRONIC ALCOHOLISM.

BY LEWIS D. MASON, M.D.,

Consulting Physician to the Inebriate Asylum, Fort Hamilton, L. I.

Read before the American Association for Study and Cure of Inebriety, at its regular meeting, December 4th, 1888.

If we consider the serum of the blood in the habitual drunkard as an alcoholized fluid, and that alcohol existing in a certain percentage in the serum acts not only upon the serum of the blood but also upon its anatomical elements, we have a condition that modifies nutrition, producing metamorphosis and degeneration of tissue. If, in connec-

tion with this, we add the fact that alcohol, *per se*, is an irritant, producing modification as well as degeneration of tissue independent of blood changes, we have an additional reason to regard alcohol as a disease producing agent.

We have then to study the pathological effects produced by alcohol on the blood from two standpoints :

First.—As to its effect on the blood itself.

Secondly.—The direct effect of the alcohol in the alcoholized blood or serum upon the tissues of the body.

It would be of interest to determine to what extent the serum of the blood can take up alcohol. That it does so, in common with the other fluids of the body, there can be no doubt. Blood taken from an habitual drunkard, and exposed to heat, will give off the fumes of alcohol. At autopsies on drunkards, the fluid in the ventricles of the brain has been ignited with a match.

There is good reason to warrant the conclusion that not only the serum of the blood, but also the fluid of the ventricles and the cerebrospinal fluid, in the case of habitual drunkards, contain alcohol to a greater or less extent, in some cases probably as much as is compatible with life. A series of chemical analyses, to determine the average percentage of alcohol in the blood of habitual drunkards, would be of extreme interest. The blood in such a condition has not only its nutritive properties very much impaired and its oxygenation and circulation retarded, but as a builder up of tissue it must be very inferior to normal blood ; in fact, it is a disintegrator of tissue. The urine of the habitual drunkard contains a certain percentage of alcohol. The application of heat or the proper chemical tests for alcohol if applied, prove this. Indeed, if we test the urine of an abstainer within a reasonable time after he has taken alcohol, the chromic acid test will show the characteristic reaction. The effort to prove that the milk of nursing mothers, using beer or other alcoholic beverages, did not contain alcohol, has resulted in failure. The toxic effect on the infant is shown in the moderate alcohol coma it experiences after nursing, and where the mother was intoxicated the convulsions that ensued.

The experiments of M. Lallemand, Duroy and Perrin seemed to demonstrate that alcohol received into the body was eliminated by the lungs, the kidneys and the skin, completely and as alcohol, and that if it was retained in the tissues it was not transformed.¹ The experiments of Anstie on the other hand disprove this. "While a certain proportion of the alcohol ingested is excreted by the lungs, kidneys and skin, a certain proportion is broken up in the blood and transformed into some other substance, probably aldehyde," just as alde-

¹ "Stimulants and Narcotics." Anstie.

hyde shortly after its administration is transformed in the blood into acetic acid. But this does not weaken the practical fact that alcohol is present in all the fluids of the body, passes through all the excretory organs, acts directly upon the nervous system and other tissues of the body, producing its deleterious effects either as alcohol or some transformation of it equally pernicious. The degeneration and alteration of tissue in chronic alcoholism is due to the following causes :

First. An impoverished, alcoholized blood, imperfect in its oxygenation and retarded in its circulation, and, consequently, producing mal-nutrition.

Secondly. The direct irritating effects of alcohol contained in said blood.

Third. The degenerating effects of alcohol on the nervous centres, producing vaso-motor paralysis and impaired reflex action.

The latter is regarded by some writers as the primal and most potent cause of general alcoholic degeneration. The principal tissue changes in chronic alcoholism are fatty, fibroid and atrophic.

The most marked examples of alcoholic fibrosis are found in the lungs, kidney and liver.

In the lungs, as alcoholic phthisis, a chronic interstitial pneumonia ; in the liver as cirrhotic, gin or hobnail liver ; in the kidney as cirrhotic, hard or contracted kidney. These fibroid changes are slow, may take years to form, but they are rapid in the latter stage. In syphilis we may resolve a gumma or modify the lesions of the tertiary stage. In pulmonary tuberculosis we may be fortunate enough to secure cicatrization of cavities, or hold the disease in check ; but the lesions of chronic alcoholism are progressive, and, when once fully established, irremediable, whether in the lungs, kidney or liver.

The effect of chronic alcoholism on the generative functions in both sexes is instructive and interesting

“Lippich² has demonstrated that alcoholized marriages produce two-thirds less children than among those who were temperate. There can be no doubt that alcoholism affects the generative function of both sexes. The testicles undergo degeneration in alcoholized persons. The spermatic fluid shows this in the well marked changes it exhibits, robbing it of the vitality indispensable to conception.”

“The alcoholic cachexia after it has attained sufficient intensity will produce this, although the organs themselves may not be diseased. Many examples of women are noted who have had children by their first marriage whose subsequent union was barren with an alcoholized husband and also the reverse. Women may become sterile by altera-

² “Alcoholic Heredity.” Dr. F. Lentz, Med. Director of Insane Asylums, Tournai, Belgium.

tions of the ovaries and matrix, and abort before maternity. From this point of view alcoholism is a more serious trouble in the mother than in the father."

Drs. Mairet and Combernal recently presented some experiments on the hereditary influence of alcohol before the Academy of Sciences of Paris.

A healthy bitch was made a chronic alcoholic, and gave birth to twelve puppies; two were still-born, three died by accident, and the remaining seven died of epileptic attacks, enteritis, pulmonary and peritoneal tuberculosis. The lesions found at the post-mortems were thickening of the bones, fatty degeneration of the liver, adhesion of the dura mater, and other marked alcoholic changes.

A strong bitch was kept intoxicated on absinthe the last three weeks of gestation. Six puppies were born; three died at birth; two were of defective intelligence; one grew up, but was defective in intelligence and nervous organization. This one was coupled with a healthy dog; of this union three puppies were born; one died of marasmus. The other two were congenitally defective, having atrophy of hind legs. One of the conclusions drawn was that the degeneration from alcohol was more prominent in the second generation than the first; also that alcohol used by the mother always produced defective offspring.

A point of interest in this connection is the etiology of dipsomania. The best authorities now agree that, while exceptionally dipsomania may arise from traumatism or alcoholism, the great majority of cases are traced to an insane or intemperate parent or parents. It is an hereditary, not an acquired neurosis.

It will be of interest to record further the results of chronic alcoholism in the lower animals, produced by experimenters with the view of determining the pathological lesions of alcohol. And none have been more zealous than the French in this direction; and of these investigators none more prominent nor painstaking than M. Magnan. We will quote therefore extensively from his work on "Alcoholism,"³ a most valuable and classical work, and the best in my experience on this special subject.

"M. Tardieu has found meningeal hæmorrhages in persons dying in a state of intoxication. These are less frequent in animals, and this is the reason why pachy-meningitis due to the prolonged action of alcohol is rarer in animals than in man."

Magnan.—"That in dogs, even at the end of two months of alcoholic poisoning, the liver undergoes fatty degeneration. A micro-

³ "On Alcoholism and the various Forms of Alcoholic Delirium, and their Treatment." Dr. V. Magnan, Physician to St. Anne Asylum, Paris; Laureate of the Institute, etc.

scopic section shows the cells have lost form, are swollen, round, infiltrated with granules and drops of fat."

M. Prupier notes the effect on a fowl to which absinthe had been given as a drink ten months. "The liver is hard, resistant, lessened in volume, has irregularities on its two surfaces, numerous whitish depressions, the intermediate parts of a reddish brown color. The microscope shows dilatation of vessels at periphery of lobules, filled with granules; extreme compression and degeneration of hepatic cells."

In another experiment a fowl was subjected to the action of red wine for ten months. "The liver is of a clear yellow color, soft, pasty, and oils the blade of the scalpel. Microscope shows cells enlarged and rounder than normal, filled with granules resembling those in parenchymatous inflammation at its beginning; here and there large fat drops."

A fowl was given white wine under similar conditions. "The liver is of good color, but is shriveled on its lower surface and borders. Microscope shows dilatation of vessels, which appear three or four times the normal size when compared with the cells which have undergone atrophic degeneration. A rabbit was subjected to alcohol. The liver shows nothing as regards capillary net-work; the cells are altered and contain two or three nuclei; around bile ducts there is an increase of connective-tissue nuclei. M. Prupier concludes that absinthe affects primarily the stroma without producing new connective tissue or sclerosis of walls of vessels. This marked new growth has not been confirmed. As for red and white wine and alcohol, their injurious effect is seen rather in the plasma and hepatic parenchyma."

Alcohol would seem to produce hepatic steatosis, but not to the exclusion of sclerosis.

A prolonged period of alcoholic intoxication, and consequent irritation, might provoke sclerosis. In the same animal, with fatty degeneration of liver, are found irritative lesions, such as pachymeningitis, sclerosis of posterior columns of spinal cord, thickening and opacity of arachnoid and pia mater, milky patches in pericardium—all these at the same time.

"The kidneys, like the liver, undergo beginning fatty degeneration. The surface is smooth and even; the cortical substance and prolongation between the pyramids of Malphigi show a well-marked yellowish tint, with small striations of a deeper color. The microscope shows tubuli slightly swollen, cloudy, filled with granular and fatty epithelium."

M. Ruge mentions adhesion of capsule to renal substance in four

cases; in three cases fatty degeneration of the heart. Magnan has seen traces of pericarditis: "The coats of the stomach in dogs who take alcohol mixed with food, are not sensibly thickened; but the mucous membrane is injected, rarely ulcerated."

When alcohol is taken without food, and directly injected by œsophageal tube or by fistula, traces of violent gastritis are seen; in one case the stomach was shriveled and thickened, and the surface of the reddish-brown mucous membrane was lined with a layer of thick, sticky, glairy mucus streaked with blood. On cleansing with a stream of water, small ulcerations with irregular borders were seen; in some places cicatrices appeared as irregular grayish plates. In the mucus were found infiltrations of blood, some in layers, others in small spots. In the same dog, the cord is not injected and appears normal; a grayish tint is seen on the posterior columns, more marked on lower third, where it has the form of a triangle with the base directed backwards on each side of the posterior median fissure; In the same locality a slight grayish tint in the anterior columns on each side of commissure; Magnan has noted the same condition in a man where chronic alcoholism terminated in general paralysis.

Kremiansky, in dogs who were given alcohol four weeks, noticed pachymeningitis.

M. Neumann observed the same fact, but also that it did not exist sometimes in a more prolonged use of alcohol. Magnan found slight infiltration and slight thickening of arachnoid and pia mater, but no false membranes of dura mater. Others, slight dilatation of vessels of dura or simple injection or œdema of pia.

This diversity is explained by Magnan as due in some cases to a meningeal hæmorrhage during drunkenness, a hæmorrhagic pachymeningitis; but while this accounts for the existence of new membranes in some dogs, Magnan asserts "that pachymeningitis may come on without pre-existing hæmorrhage in certain nervous affections and chronic alcoholism."

We will close this testimony with the result on a terrier dog, two months old; vigorous; weighing thirteen pounds. On alcoholized diet, more or less continuous for nearly six months, an occasional rest being given.

Autopsy.—Cerebral dura mater slightly injected. No false membranes. Arachnoid and pia œdematous at base. Rosy tint over interpeduncular space. Membranes separate easily everywhere. Section of hemispheres show fine stippling. No distinct hæmorrhage. Surface of ventricles injected. Abundant vascular ramification on upper surfaces of optic thalamus and corpus striatum, the ependyma being slightly thickened. On section, no deep lesions.

Spinal dura, normal; arachnoid and pia injected, especially lower part of dorsal region. Sections of cord show marked injection of gray matter. No gelatinous tint in columns. No microscopic change.

Lungs.—Large marblings of a pale rose or black red, as in bronchopneumonia. Carnification of deep red portion; incompressible; non-crepitant, sinks in water. Right lung, at base, shows grayish points; bronchi opened showed viscid mucus mixed with blood.

Heart.—Right cavities distended with liquid blood mixed with black clots. Left cavities, no change.

Visceral Pericardium has opaline tint, milky over coronary arteries, particularly at base.

Liver.—Yellowish; deep colored points, which microscope shows are seat of well-marked fatty degeneration.

Kidneys.—Yellowish in cortical substance and between pyramids.

Spleen.—Normal.

Stomach.—Several small clots.

Mucous Membrane.—Viscid, very thick, adherent mucus. Membrane does not show any ulcerations."

We have thus quoted extensively from these French experimenters that others may be encouraged to follow similar researches with regard to the "pathological effects of alcohol" in animals, with the advantage of improved pathological knowledge and modern appliances; for these investigations demonstrate not only that researches as to the effects of alcohol can be satisfactorily conducted in the lower animals, but they also corroborate what has been demonstrated to be the effects of chronic alcoholism on procreation in the human species, as well as its other pathological effects.

Alcohol acts not only indirectly through the blood as an irritant, provoking fibrosis or other tissue changes, "but on the alimentary canal, particularly the stomach. The local effects of habitual doses of concentrated alcohol are seen in the permanent congestion of the blood vessels, exaggerated or vitiated secretions from the gastric glands, and ultimately a degenerative change in the structure of the submucous tissues, which consists in the disappearance of characteristic secreting structures and hypertrophic exaggeration of fibrous tissue."⁴

The effect of alcohol upon muscular or other tissue, producing fatty degeneration, is similar in this respect to the action of phosphorus, arsenic, or other poisons. Fatty degeneration of the pancreas from alcoholism shows⁵ "the glandular parenchyma has partially or entirely disappeared; it may be replaced by adipose tissue, which is developed in the fibrous stroma of the organ around its vessels

⁴It must be noted that the autopsies in cases of chronic alcoholism in man represent a *longer duration* of the action of alcohol than in animals.

and glandular ducts." In some instances the acini or characteristic gland structure is lost entirely and replaced with fatty tissue.

But the most marked evidence of the deteriorating effects of alcohol is seen in its action on the nervous system. "It is clear that the nervous centres, independently of the ill effects on their nutrition of the blood changes, have a certain chemical attraction for alcohol, which accordingly are found in their tissue.

The characteristic changes which have been observed in the brain, medulla oblongata, etc., of confirmed drinkers, consists essentially of a peculiar atrophic modification by which the true elements of nervous tissue are partially removed; the total mass of nervous matter wastes, serous fluid is effused into the ventricles and the arachnoid, while simultaneously there is a marked development of fibrous tissue, granular fat, and other elements which belong to a low order of vitalized products."⁵

From these conditions arise vaso-motor paralysis, with all the results that follow a defective supply of blood and an impaired circulation, tending to local stasis. Moreover, if we exclude traumatism, there is not any disease of the nervous system resulting from other causes than alcoholism, at least with few exceptions that alcohol cannot produce—alcoholic neuritis, alcoholic anæsthesia, general paralysis, serous apoplexy, etc., and those cerebral conditions from which arise the acute and chronic forms of mental derangement. The nerves of special sense are not exempt. "The abuse of alcoholic stimulants has been said to be the cause of amaurosis, and, as a proof of this, the fact has been adduced that the affection has been arrested or even cured by completely giving up the habit of drinking" (Sichel). "This much is certain, that amblyopia occurs in great misproportion among habitual drinkers. It is generally first seen as night-blindness, but soon becomes constant, and gray atrophy of the nerve is recognized by the ophthalmoscope"(Pagenstecher).

"One point of interest in this connection, relating to the action of alcohol on the nervous system, is the theory advanced by writers on this subject, and it is a very plausible one: that the degeneration of all tissue in cases of alcoholism is due primarily to the action of alcohol on the nervous centres, and through these, by vaso-motor disturbance or impaired reflex action, upon the organs or tissues which these nerve centres, or vessels influenced by them, supply." But it would seem, while regarding this as the prime cause of alcoholic degeneration, we could not ignore the fact that the blood itself was in chronic alcoholism much deteriorated as to its quality and retarded as to its circula-

⁵ "Cornil and Ranvier." Path. Hist. Shakespeare.

⁶ "Chronic Alcoholism." Anstie.

tion, and, moreover, that it contained a chemical irritant. The limits of this paper will not permit us to consider in detail all the pathological changes due to alcohol. It affects all the tissues of the body; even the bones are not exempt.

We have therefore generalized our statements and taken a view over the whole field, rather than endeavored to carry out and elaborate any special line of thought. Our object has been to demonstrate that there is abundant material for the pathologist and the microscopist to investigate, and a neglected but nevertheless a rich field for medical research. How little progress has been made in the study of the pathology of chronic alcoholism and the diseases incident to alcoholism. The lens of the microscopist has been focussed on the microbes of tuberculosis, charbon, anthrax, cholera, and leprosy; cultures of various bacteria have been developed, and the diseases themselves reproduced in the inferior animals from culture inoculations. The whole scientific world stands in daily expectation of new discoveries. Antisepsis, based on bacteriology, has revolutionized medicine and surgery, and has rendered the apparently impossible not only possible but an absolute certainty.

Alcohol has not any microbe, but the grand total of its mortality will exceed the combined effect of all the bacteria that have ever passed the microscopic field or developed in the culture tube of the bacteriologist; and yet while in all other diseases pathological research, both gross and microscopic, seems almost to have exhausted itself, where is there an authentic work upon the "Pathological Changes of Chronic Alcoholism" in the English or Continental languages that we can resort to for information? It is hoped that the directors of laboratories will turn their appliances for pathological research in this direction also, and that the result will be an American work on "The Pathological Changes of Chronic Alcoholism," and that the whole study of the action of alcohol on the blood and tissues of the body as a disease-producing agent will be not fragmentary as in the past, but placed on a substantial basis. In 1887, Dr. H. F. Formad, at a stated meeting of the "Philadelphia Pathological Society," presented "an analysis of two hundred and fifty autopsies on drunkards, illustrating the most prominent anatomical lesions of chronic alcoholism." A most notable international congress was held in London, July, 1887. Prominent delegates from the scientific centres of every nationality were present. It was a purely medical congress, and the papers presented were on medical topics bearing directly on the subject—alcoholism. In the same year there was a similar gathering at Zurich, Switzerland. At the present time "The London Pathological Society" are debating the relation of alcohol to disease. Pathological speci-

mens will be presented and a discussion follow. Nor are the medical organizations of other countries inactive, or the foreign and American medical journals indifferent on the relation of alcohol to disease. There seems to be a general interest throughout the medical centres of the civilized world on this subject.

In view of all this and with the object of exciting further interest in this important subject in the United States, the "American Association for the Study and Cure of Inebriety" have offered an award for the best essay on "The Pathological Changes of Chronic Alcoholism Capable of Microscope Demonstration."

The pages of the *Journal of Inebriety*,⁷ the organ of the Society, will always be open to papers, reports of cases or discussions bearing on this subject and kindred medical topics.

Let us hope that the ensuing year will open as auspiciously as the one that is now passing away, and the records of medicine at its close will show much valuable information gathered in this hitherto neglected field.

A CASE OF ABSCESS OF THE OVARY.

BY E. S. RUPERT, M. D.

Read Before the Brooklyn Pathological Society, November 22d, 1888.

The specimen herewith presented is from a case the history of which is as follows, viz.:

Mrs. S. M. B., aged twenty-three, married at sixteen. She lived with her husband for four years, separating from him three years ago. She has one child, now six years old. Her labor and recovery were normal. She has had no miscarriages.

Puberty at fourteen; up to the time of her marriage and subsequent to it, menstruation came on every two or three weeks, the flow lasting for about six days. No pain was felt until six months after the birth of the child. She then suffered with severe cramps in the lower part of the abdomen, and pain in the lumbo-sacral region just before and for the first two days of the flow. She also complained of bearing-down pelvic sensations which continued to grow worse. One year later she had an attack of vaginitis. The discharge was purulent; associated with this was painful urination. These symptoms lasted one week, yielding in that time to treatment. About three weeks later she had

⁷ "Journal of Inebriety." T. D. Crothers, Editor, Hartford, Conn.

an attack of pelvic cellulitis which confined her to bed for four weeks. Four months later she had a similar attack which lasted three weeks.

After these attacks she suffered from constant pain in the groin, and great tenderness on pressure over the region of the iliac fossa on the right side. Severe pain, which she described as throbbing, was felt in the right ovarian region whenever she attempted to walk.

In the spring of 1888 she consulted a physician. Examination per vaginam disclosed the presence of a large, round mass, cystic in character, to the right of the uterus and connected to it. This mass was very sensitive to the touch.

A diagnosis was made of cystic ovary, and an operation advised. In May last an abdominal section was performed and an abscess of the right ovary was found. The patient made a good recovery, except that a sinus was left in the track of the drainage tube.

Since the operation menstruation has taken place every four weeks and is painless.

On the 15th of last October a second section was made for the relief of the sinus, the patient making a good recovery.

The husband of the patient was a man of bad character and the vaginitis from which she suffered was probably of gonorrhœal origin.

Acute inflammation of the ovary is more often the result of inflammation of the neighboring tissues than it is a primary affection. The vaginitis probably extended along the tube until the ovary was involved in the suppurative process.

A DERMOID CYST OF THE ORBIT SIMULATING AN OSTEOMA.

BY L. A. W. ALLEMAN, M.D.

Read Before the Brooklyn Pathological Society, Nov. 22d, 1888.

The only excuse that I can offer for asking your attention to the notes of a case of tumor of the orbit is, that the extreme obscurity which attends an accurate diagnosis in these cases, and the vital importance to the patient of arriving, as near as may, be at such a diagnosis, surrounds this subject with a never-failing interest.

Even when it is possible to diagnosticate the presence of an intra-orbital tumor, the differential diagnosis, between the different possible varieties, again presents no little difficulty. The symptoms in all cases are very similar. The tumor is as a rule too deep-seated to allow of a

digital examination, and even in cases in which this is, in a measure, possible, it is extremely difficult to judge of the character of a tumor, through the tissues by which it is hidden from your examination.

The following case was one in which such an examination was extremely confusing, and pointed strongly to a condition of affairs entirely different from those existing.

The patient, H. A., aged three years, was first brought to the New York Eye and Ear Infirmary in June last, in the service of Dr. Derby. The parents of the child stated that for a year past they had noticed a lump on the left eye. Upon examination a small tumor was discovered at the roof of the orbit, on the temporal side. It could be plainly distinguished by pressing the tip of the finger back into the orbit above the globe. The tumor seemed to be hard and immobile, not at all sensitive on pressure and did not appear to give the patient the least pain nor inconvenience.

The child seemed to be in perfect health, and no history of injury could be obtained. The patient was kept under observation for several days, no change taking place in the tumor during that time. He then disappeared—a too frequent experience with interesting cases in dispensary practice. A positive diagnosis was not made, but the case was entered on the records as a case of probable osteoma of the orbit. In July following the patient was again brought to the infirmary. The growth had changed but little in the interval, if at all, it was slightly larger. I, however, thought best to cut down upon it, and if the conditions seemed favorable, to remove it. As I was, however, prevented from being present at the infirmary on the day fixed for the operation, the patient again disappeared until the present month. The tumor seemed this time to have slightly increased in size, and Dr. Derby determined to remove it, which he did on November 19. A curved incision was made through the skin just below the margin of the orbit, and the tumor carefully dissected down upon. Greatly to our surprise the lachrymal gland was found pushed forward in front of the tumor and held firmly in place. Behind this a cyst was found and removed, the contents of which I herewith present. It appeared to be a sebaceous cyst, and this diagnosis was verified by Dr. Richmond Lennox, the pathologist of the infirmary, who kindly examined the specimen for me. This cyst had pushed the lachrymal gland before it, and held it so firmly fixed that, on the very imperfect examination that was alone possible it appeared to be a bony tumor springing from the roof of the orbit.

Fortunately the error in diagnosis led to no mistakes in treatment, an operation being necessary in any case.

The wisdom of an early removal of an osseous tumor of the orbit is

indisputable. Dr. Knapp, in commenting on a case of bony tumor of the orbit upon which he operated says: "Never delay operating an osteoma of the orbit or its neighboring cavities. These tumors, almost without exception, have a steady growth. It is commonly easy and harmless to remove them as long as they are of limited size, say up to a large English walnut, if their seat be the roof of the orbit or the frontal sinus, and never if they are located in the nasal passages or the malar antrum. When they have a large base at the roof of the orbit, or come out of the frontal sinus in a considerable mass and in the course of years have caused exophthalmus or sloughing of the eye-ball, or a portion of them can be felt under the skin above the eyebrow, near the roof of the nose, their removal has invariably proved fatal, and I do not know whether modern surgery with all its antiseptic safeguards and its brilliant achievements, not to say results, in intracranial operations would score many successes in such attempts."¹

It seems to me that the plea for an early operation is equally applicable to all cases of orbital tumors which are increasing in size. It is quite impossible to determine whether a tumor be of a malignant character or not at an early stage of its progress, when its removal would give the only chance of immunity from its recurrence. If the tumor is increasing in size it is sure, sooner or later, to destroy the eye or at least to so damage the nerve as to destroy vision. The dangers of the operation are increased by the larger size and by greater involvement of the surrounding tissue should the tumor be malignant in character. The suffering and inconvenience of the patient are also prolonged by the delay. On the other hand, I can see no possible advantage to be gained by postponing an operation, which is inevitable.



A CASE OF OVARIOTOMY.

BY ALBERT BRINKMAN, M. D.

Secretary Brooklyn Pathological Society; Assistant Surgeon Brooklyn Eye and Ear Hospital.

Read Before the Brooklyn Pathological Society, Dec. 13, 1888.

MR. PRESIDENT AND GENTLEMEN :—The ovary which I present to you to-night is not a diseased one beyond a few cysts which were found on its surface and ruptured in its removal; it rather represents a pathological condition, viz., prolapsus.

¹ Archives of Ophth., March, 1888.

The patient from whom this ovary was taken is 23 years old, married, and has never been pregnant. She came to me about eight months ago with the following history: For the past two years she has been suffering from pain in the left inguinal region; this pain is increased on walking and when it becomes severe is attended with nausea. Menstruation is very painful, each month the ovary showing great intumescence, with local heat and insufferable anguish, the local disturbance appearing a few days before the menstrual epoch and lasting until ovulation has passed. There is also pain on intercourse or dyspareunia. Besides the inguinal tenderness there is pain across the lower part of the back. The patient is anæmic and hysterical, with a poor appetite and low spirits. The bowels are regular.

Upon vaginal examination I found the uterus retroverted and prolapse of the left ovary. Inserting a Hodge pessary relieved the backache but increased the inguinal pain. The patient wore the pessary for six weeks when it became unbearable. No injury to the vagina to account for the distress. The pessary was inserted at intervals during the remainder of the treatment, but always had to be removed in twenty-four to forty-eight hours. The vagina was put under a systematic course of treatment by cotton tampons, with different medicinal agents, but without relief or benefit. A blister was applied over the abdomen at the site of the pain, but no improvement. The knee chest posture was carried out faithfully, yet the pain continued.

Internally, the bromides, morphia at menstrual epochs, *salix nigra*, *viburnum prunifolium*, *belladonna*, *digitalis*, *ergot*, and all remedies that are supposed to influence the reproductive organs were used, but fruitlessly. Tonics were ordered for the general condition, but that did not improve, and the patient became more anæmic and hypochondriacal. The patient had heard that a friend of hers had had her ovary removed for a similar condition and suggested the same treatment. Feeling that the patient under the present treatment was not getting value received I suggested consultation, and Dr. Buckmaster saw the case with me. The Doctor prescribed Dr. Weir Mitchell's diet cure with massage. This was faithfully tried for six weeks, but the suffering continued.

I then had Dr. Skene see the case, who diagnosticated retroversion of the uterus with ante-flexion and prolapse of left ovary. The suggestion of operative interference being laid before him he urged that every thing else be tried first, and prescribed *ichthyol* 3 i ss., *aqua* 3 iii to be used locally on a tampon. This was tried for two weeks, when menses occurred. The insufferable anguish caused the patient to tell me that if I refused to operate she would go to New York and have it done. Although a physician should not be influenced by his patient, still it is

the duty of Brooklyn physicians to keep their cases and operations in Brooklyn, and I concluded to operate. I saw nothing else to be done. It was impossible to relieve the uterine displacement, because the good gained by support of a pessary was rendered nil by the pressure of that same pessary on the prolapsed ovary. The cotton tampons proved no better. The condition was not remediable by ordinary local treatment and, although the criticism arises in many cases of Battey's operation, whether the procedure was necessary, whether jeopardizing a life is proper because spaying is the fashion of the hour in medicine, in this case it was justifiable. No operation is called for until thorough trial has been made of all remedies applied to the local condition, and everything has been done in the way of tonics and diet, and those general hygienic measures which are known to act beneficially to raise the standard of health, but if all these remedies fail and life has become a burden to the woman herself and those surrounding her, we gladly undertake a proceeding which holds out a hope of relief. In the present instance the result has justified the means. Hegar (*Cyclop. Obst. and Gynæk.*) "Castration is indicated in anomalies and disease of the sexual organs . . . which are followed by long-continued progressive illness, which interferes with the enjoyment of life and ordinary duties."

On the 21st of November, with the valuable assistance of Dr. Buckmaster and Dr. Culkin, I removed the offending ovary. Ether was administered by Dr. Culkin, the abdomen washed with soap and then with bichloride solution 1-2000. All the instruments used were kept immersed in carbolic acid 1-20. The sponges were placed in a 1-2000 warm bichloride solution. An incision four inches long, ending a little above the mons veneris was made in the median line.

Upon reaching the fascia transversalis a director was used. After cutting through this fascia the peritonæum was brought to view. This was picked up with the forceps and an opening cautiously made with a scissors. The peritoneal wound was smaller than the opening in the skin, and being found too small to work comfortably was enlarged with a scissors. All bleeding was controlled by forceps before the peritoneal cavity was opened. Placing the hand in 95 per cent. alcohol as an antiseptic, it was introduced and the ovary brought forward out of the wound. A double catgut ligature was passed through the hilus and cut, one thread was tied around one half of the base and the other round the other half; the ovary was then cut off with a knife. After holding the pedicle for a moment and finding no bleeding it was dropped back into the peritoneal cavity, the peritonæum was sewed with the continuous catgut suture. The abdominal incision was then closed also with catgut, a number of straight needles threaded on the catgut in such a manner that as a suture was needed there would be a

needle on each end. The needles were passed first the one and then the other from the peritoneal aspect towards the skin. All the sutures were passed before any one of them was ligatured and the ends drawn together to see if there were sufficient to close the wound. Two superficial stitches were found necessary to complete the union.

Rubber plaster was now applied to reinforce the sutures. A layer of carbolized cotton put on and over all a binder was placed,

The patient rallied well, received morphia hypodermically to relieve pain. The temperature never went above 101° nor the pulse above 106.

On the sixth day, there being a large amount of flatus an enema of turpentine and soap suds was given with partial relief. On the eighth day the bowels moved, but the motions being hard caused considerable pain.

After that the patient made an uninterrupted recovery, having menstruated once without the suffering she had endured heretofore.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

TO MEDICAL MICROSCOPISTS.

We desire to call attention to the announcement in this number of the JOURNAL of a prize of \$100 offered by Dr. Lewis D. Mason, of this city, for the best original essay on "The Pathological Lesions of Chronic Alcoholism Capable of Microscopic Demonstration." This field of investigation is one in which comparatively little work has as yet been done. It is, however, one which would yield a rich and valuable harvest if the workers in microscopy would but turn their attention to it. The names of the committee of award are an ample guarantee that the essays will be justly and critically considered, and it is to be hoped that their judgment will be put to the fullest test by a large number of competing essayists.

CONTAGIOUS DISEASE HOSPITAL.

After many years of waiting the greatest sanitary need of Brooklyn is about to be met. The Commissioner of Health, Dr. John Griffin, announces in his annual report to the Mayor that a hospital for contagious diseases will be erected during the present year. The portion of the report which deals with this subject is so full of interest to the profession that we quote it in full.

"Much has been said of the lack of accommodation for those afflicted by this justly feared sickness, (small pox) and against whom so rigid a system of quarantine is habitually enforced, and an attempt was made temporarily and with success to render their enforced stay at the hospital as comfortable as possible. The complaints of the inmates were not directed against the administration, but rather against the wretched quarters. Skilled medical attendance, good nursing, and kindly appreciation of the needs of the patients, reduced to a minimum the mortality, but could not entirely compensate for the hardships of a forcible severance from home, and incarceration in what was popularly designated 'The Pest House.'

"Happily this condition will soon change and ample provision will be made for the accommodation and well-being of all. By special statute a commission has been formed for the purchase of a site and the erection of a hospital for contagious diseases. My predecessors had labored in this direction, but only now has the project attained any practical shape.

“Your Honor, associated with the Commissioner of the Department of City Works and the Commissioner of the Department of Health, have procured by purchase, for the sum of sixteen thousand dollars, a most eligible and satisfactory site, without the city limits, but easily accessible from all points. The procurement of this location was only had after great effort and the exercise of the greatest prudence in making the preliminary enquiries and search, in order not to frighten away would-be sellers of property. Unquestionably the neighborhood of such an institution is calculated to outrage the sentiment of the inhabitants and depreciate values, but of its necessity there can be no question.

“An appropriation of sixty-five thousand dollars, available after the first of January, will permit of the construction of hospital buildings, the plans for which are now being prepared and under consideration. They will be of such character as can admit of the reception of all persons suffering from contagious disease, who may desire private accommodations in return for suitable payment, as well as of those who may not be able to afford such expenditure.

“By a system of separate pavilions, the most perfect isolation can be maintained, and the extent of grounds, at the disposal of the authorities, will admit of the erection of any number of structures, cheaply and rapidly, to meet any possible emergency.

“The propriety of the establishment of such a general hospital may be admitted by those even who claim that the most effective quarantine can be had by removing those who are well from the tainted houses. The latter, of course, may continue to propagate the evil, unless controlled by proper sanitary precautions, but a satisfactory separation is not always feasible. There are some who cannot afford nor procure proper care at their homes or lodging houses, and for them a hospital is indispensable.”

Although the Commissioner does not state in his report the location of the proposed hospital, it is, we are informed, to be erected in the town of Flatbush, on property bounded by Kingston and Albany avenues, Tulip and Fennimore streets.

BOUND COPIES OF THE JOURNAL.

Bound copies of the JOURNAL may be obtained at the Society Rooms, 356 Bridge Street, in exchange for the unbound numbers, on payment of fifty cents a volume, or one dollar for the entire year.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

A regular meeting of the Medical Society of the County of Kings was held at the society rooms, 356 Bridge Street, Tuesday evening, November 20th, 1888, at 8 o'clock, Dr. Wallace in the chair. There were about eighty-five members present. The minutes of the last meeting were read and approved.

The Council reported favorably upon the names of the following: Drs. Fred. J. S. Shoop, Julius A. Freeman, May R. Owens, Louis M. Dusseldorf, and Thos. L. Wells, and recommended them for membership.

The President declared the following elected to membership: Drs. Sidney Allen Fox, Fred. L. Goddard, Stanton Allen, Horace B. Scott, Henry Conkling, B. F. Welch, A. T. Carroll, James Downie, Jos. O'Grady, Lefferts A. McClelland, J. E. Dusseldorf, John Morgan, J. J. Keyes, George H. Treadwell.

The following gentlemen were proposed for membership: Drs. Praeger, Reid Ave. and Van Buren St., Jeff. Med. Col., proposed by G. R. Fowler, M.D., seconded by W. B. Chase, M.D.; Leon W. Fleming, Adams St., L. I. C. H., 1886, proposed by Chas. E. De La Vergne, seconded by Jos. H. Hunt, M. D.; George Wagner White, 163 Clinton St., L. I. C. H., 1888, proposed by R. L. Dickinson, M.D., seconded by Ernest Palmer, M.D.; Wm. H. Shepard, 196 Fifty-second St., So. Brooklyn, L. I. C. H., proposed by Ernest Palmer, M.D., seconded by Dr. C. E. De La Vergne; H. S. Thorn, Ft. Hamilton, University of Mich., 1869, proposed by W. B. Chase, M.D., seconded by Geo. G. Hopkins; Belcher Hyde, 282 McDonough St., University Med. Col., N. Y., 1883, proposed by J. W. Hyde, M.D., seconded by Ernest Palmer, M.D.

SCIENTIFIC BUSINESS.

The first paper of the evening, by Dr. R. G. Eccles, entitled "Descent and Disease," was then read, and explained with blackboard diagrams, by Dr. Eccles. This paper was discussed by Drs. Pilcher, Bunker, Fowler, and Hopkins.

The reading and discussion of this paper having occupied so long a time, on motion of Dr. Stuart, the reading of the paper by Dr. Henry Conkling, entitled "Analysis of One Hundred Cases of Anæ-

mia," set down for this meeting, was postponed, and made the first order of business for the next meeting.

The committee appointed at the last meeting to draft a minute relative to the death of the late Dr. Thallon, presented the following report, which was received and ordered spread on the minutes :

WILLIAM MORRISON THALLON

Was born in Brooklyn, December 9th, 1858. He died of typhoid, in Brooklyn, October 1st, 1888.

The circumstances of his life were simple and fortunate. His father, Robert Thallon, was a thrifty, large-minded, cultivated Scotchman, who, early in life, put by a sufficient competency, and thenceforward devoted himself to his family. Between him and his son, William, the closest sympathy always existed.

In 1864 the family went abroad, and spent three years in France, Switzerland, and Germany.

In 1867, when little Will was nine years old, they settled in Leipzig, where he attended school. In the course of the next four years he became effectually Teutonized, and ever afterwards he spoke German as easily as English.

In 1871 the Thallons moved to London, and Will now entered the University-College School in Gower Street. Here he played, fought, and studied with young Huxley, Conway, Dicker, Justin McCarthy, and other lads of promise, till the spring of 1874. The following summer was spent in Paris, and autumn found him once more a Brooklyn boy, after ten years of absence.

The next three years were passed at the Polytechnic Institute, where he graduated in 1877.

Thus ended the days of his boyhood. "Now, then," asked his father, "what will be your choice for a vocation?" "I am not quite decided." "Well, then, we'll take a run through Europe, and talk the matter over; pack your hand-bag." Off they went, father and son. As they journeyed, they talked the matter over. What talks those must have been! At length the young man said: "I have it, father; medicine is the thing for me." "All right, Will; now go home." And in a few weeks, Will was hard at work in the College of Physicians and Surgeons, New York. He graduated—honor man, of course—in March, 1880.

Then came a pleasant trip to Europe in company with Drs. J. C. Hutchison and Samuel G. Armor.

In the autumn of 1880 he became an interne of the Brooklyn City Hospital, where he served for one year.

In the autumn of 1881 he again crossed the ocean, intending to

spend the next two years in study. He looked through the London hospitals, visited Edinburgh, spent a few happy days at the house of Thomas Keith, and then settled down for work in Vienna. But, early in January, 1882, the condition of his father's health became so alarming that he was obliged to return home. His father died in May. The following July and August were spent in London.

In September, 1882, he began practice on Clinton Street, Brooklyn.

Two years later he once more visited London, where, on the 18th of September, 1884, Miss Dicker became Mrs. Thallon, and a month afterwards the young couple were at home in Brooklyn, prosecuting a worthy struggle for existence. The doctor was not rich, as many have supposed. He possessed nothing but what he himself had earned and saved.

In 1882 he became a member of this society, and at the time of his death he was *facile princeps* in our counsels.

Young, unobtrusive, unassuming, gifted with a mighty brain and a noble temperament, he fascinated those who came in contact with him, easily commanding the respect of just men and the love of good men. He was a hard worker, a true man, high-minded, kind, generous, even-tempered, charitable in his judgments, uncompromising in his detestation of vice.

"His laughter was cheery to hear, his eyes shone confidently, his voice spoke truth."

The doctor was a slender, wiry, muscular man, of medium height. He was plain, quiet, at ease everywhere. He never forced your attention; he unconsciously stole your heart. The greater your intellectual endowments, the more readily you recognized in him your peer; the more diversified your attainments, the more numerous your points of contact with this accomplished man.

No wonder that spontaneous tributes of affection, and expressions of grief that will not be comforted, came pouring in from every quarter.

One who had known him always—an English university professor—writes:

"It will be some comfort to you all to remember how his whole life has not one thing to show which we do not love to recall; and though he has been cut off in the very height of the brightest promise, he lived long enough to do more work than many men of much greater age."

For many years he was secretary of the Shakespeare Club; and the minutes which he wrote make up a unique volume, full of wisdom and wit, keen criticism, pointed admonition, playful fancy, and all possi-

ble kindness. It is the voice of the Shakespeare Club which says :

“Thallon’s acquaintance with literature was wide and discriminating; for his reading began early, was continued as a habit, and his taste became cultivated and critical. His literary instincts were true, and his judgment of authors sure-footed. Indeed, it was this soundness of judgment which was most remarkable in him, and which showed itself even in the ordinary affairs of life. There are those in this club who know how eagerly his advice was sought in matters of business, and how wise it proved when followed.”

And yet it was not the Shakespeare Club, which he left in the occupancy of a beautiful and permanent home; but quite another organization. When Dr. Thallon entered the Medical Society of the County of Kings, he found it a vagrant, with occasional longings for a settled life. He worked with us, and for us, but six years; and those who are familiar with our affairs know best how Dr. Thallon’s genius, tact, and industry inspired and guided the movement which led to our establishment in the ownership of this building. Verily, the members of this society likewise, “know how eagerly his advice was sought in matters of business, and how wise it proved when followed.”

The doctor wrote in a style that was remarkable for simplicity, grace, and power. Of permanent value and interest are his essay on “Ether Narcosis,” and a masterly article in which he advocates the “Treatment of Diphtheria by large Doses of Bichloride of Mercury.” He seldom allowed himself the pleasure of engaging in occupations of a strictly literary nature; but his elaborate and trenchant essay on “The Relations of George Eliot’s Life to her Works” is an earnest of the splendid work which he might have done as a man of letters.

He was fond of music and of art. The Rembrandt Club loved, valued, and esteemed none of its members more highly than William M. Thallon.

He was one of the organizers, and the first secretary, of the Brooklyn Surgical Society, whose enviable record is known to all.

About one year ago, he became assistant surgeon to the Methodist Episcopal Hospital. His career in that institution was characteristically modest, helpful, and successful. He was grateful to his chief for the opportunity of performing some capital operations.

In May of this year, he moved into a beautiful and convenient house, which he had taken great delight in building and adapting to the needs of his business and family. There he lived for a few short months. There he died. And there his wife and three little children await the hour of the great reunion.

About the time of his moving into the new house, a friend left on the doctor's table, one evening, a little present of a book, on the fly-leaf of which was written :

WILLIAM M. THALLON,
probus, fortis, felix.

Respectfully submitted,

EDWARD SEAMAN BUNKER,
GEORGE R. FOWLER,
WM. H. B. PRATT,

Committee of the Medical Society of the County of Kings.

On motion of Dr. Skene, duly seconded, it was

RESOLVED, That this society, as a matter of courtesy, extend an invitation to the American Public Health Association to hold its next meeting in Brooklyn.

A communication from the Secretary of the Hoagland Laboratory, extending to members of this society a cordial invitation to Prof. Sternberg's lectures on bacteriology, was read, received, and placed on file.

On motion, adjourned.

W. M. HUTCHINSON,
Secretary.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

A regular meeting of the Medical Society of the County of Kings was held in the society rooms, No. 366 Bridge Street, on Tuesday evening, December 18th, 1888, at 8 o'clock, Dr. Wallace in the chair. There were about eighty-five members present. The minutes of the previous meeting were read and approved. The Council reported favorably upon the names of Drs. A. W. Lawrence, Geo. Wagner White, William H. Shepard, Leon M. Fleming, Belcher Hyde, H. S. Thorn, and J. H. Marshall.

The following, having been recommended by the Council, were declared elected to membership : Drs. Fred. J. Shoop, Julius A. Freeman, May R. Owen, Louis M. Dusseldorf, and Thomas L. Wells.

The following name was proposed for membership : Dr. Horace Sloat, 507 Van Buren Street, L. I. C. H., 1887, proposed by Dr. E. A. Day, seconded by Dr. Wm. M. Hutchinson.

SCIENTIFIC BUSINESS.

The paper by Dr. Henry Conkling, entitled "Analysis of One Hundred Cases of Anæmia," which was made the first order of business for this meeting, was then read.

This paper was discussed by Drs. Stuart, Raymond, Walker, Kretzschmar, and Burge.

NEW BUSINESS.

The nomination of officers and delegates for the ensuing year was then proceeded with, and the following is the result: President, A. Ross Matheson and F. W. Rockwell; Vice-President, Geo. W. Brush, I. H. Barber, and H. L. Bartlett; Secretary, Wm. M. Hutchinson; Assistant Secretary, David Myerle; Treasurer, W. B. Chase; Librarian, J. H. Hunt; Censors—J. C. Shaw, Belcher Hyde, Benjamin Edson, G. A. Evans, Wm. Maddren, P. H. Kretzschmar, Chas. Jewett, Ernest Palmer, and Gordon R. Hall; Trustees—Chas. Jewett, A. J. C. Skene, B. F. Westbrook, and J. T. Conkling; Delegates (12) to State Medical Society—Wm. Maddren, Chas. E. De La Vergne, F. E. West, B. F. Westbrook, P. E. Kretzschmar, Geo. R. Fowler, Fred. D. Bailey, Chas. N. Cox, Sidney Allen Fox, L. S. Pilcher, H. L. Bartlett, Geo. A. Evans, R. L. Dickinson, Chas. N. D. Jones, and R. G. Eccles.

There being no further business, on motion the meeting adjourned.

W. M. HUTCHINSON,

Secretary.

REVIEWS.

HANDBOOK OF HISTORICAL AND GEOGRAPHICAL PHTHISIOLOGY, WITH SPECIAL REFERENCE TO THE DISTRIBUTION OF CONSUMPTION IN THE U. S. Compiled and arranged by George A. Evans, M.D. 12vo, c., pp. 295. D. Appleton & Co., N. Y.

As stated on the title-page, this volume is compiled and arranged by the gentleman who is responsible for its appearance. Consequently his personal views on the subjects therein considered can be ascertained only by inference, and thus far criticism is disarmed. It has evidently involved much careful labor in preparation. The subject-title is obsolete and somewhat repellant. The subject-matter is of great interest. The historical sketch of phthisis, derived mainly from Waldenburg's treatise and fortified by numerous quotations from contemporary writers, gives a fair statement of the various theories from Hippocrates to Koch.

Two chapters on the general geographical distribution of phthisis in the United States and foreign countries, are followed by a section on the topography and climate of the States and Territories, with tables showing the death-rate from consumption, per thousand inhabitants, in places of ten thousand population and upward. This section of the book ends with a brief classification of climates in this country, arranged with reference to temperature, moisture, and elevation. The fifth section comprises twenty-two pages of U. S. Signal Service reports concerning the monthly and annual averages of barometer, temperature, relative humidity, and precipitation at the various stations. The sixth section on Etiology contains much that is of interest. The various etiological factors are treated in succession, and by means of full excerpts from the authorities, the chapter furnishes a quite complete and very readable synopsis of the present state of the medical mind on the points in question. There is an apparently substantial agreement as to the influence of temperature, humidity, dampness of soil, elevation, and social state. In the seventh and last section, entitled "Conclusions," the compiler quotes with approval Hirsch's statement, which is, substantially, that phthisis is rare at great altitudes, and that the main factors are over-crowding and bad hygiene. Heat and cold, *per se*, have no influence. Humidity of the air is less important than dampness of soil. Finally, occupation is important as tending to good or bad hygiene. The vexed question of the contagiousness of phthisis is left *sub judice*. The compiler believes "that the tubercle bacillus holds the same etiological relation to pulmonary phthisis that certain other micro-organisms hold to external surgical affections." From one holding this view we should have expected a positive affirmation of contagiousness. A point of interest relates to the author's belief that "the respiration of antiseptic air by phthisical subjects will be found in the future to be as successful in the treatment of consumption as topical antiseptic influences have been in the treatment of external surgical affections." We must range ourselves with those who in the author's words consider it "only a Utopian idea." The antiseptic cleansing of the upper and accessible air-passages may be carried out with a reasonable degree of thoroughness by high-pressure coarse sprays. On the other hand, the anatomical obstacles to destroying the bacilli, after they have once found a lodgment in the lung substance, appear to us insurmountable. The difficulties in the way of sterilizing the natural and attainable orifices of the body, the vagina, the rectum, the mouth, even with the aid of

energetic scrubbing and liberal douches of far greater germicidal strength than is practicable in the air-passages, are well known to every surgeon who practices strict antiseptis. Suppose air, no matter how heavily laden with antiseptic vapor, to have slowly found its way, by the law of diffusion of gases, through the bronchioles to the terminal alveoli, or even to a small cavity, how much effect would this quietly moving atmosphere have upon bacilli embedded in tenacious mucus, or hidden snugly away in connective tissue? Therapeutic advance should come by the discovery of new means, or improved methods of employing old devices, for rendering the tissues unfit soil for the growth of the bacillus. This is shown to be possible by the undoubted fact that the same organism may be at one time vulnerable, at another, invulnerable to bacillary phthisis, recovery following attack.

In conclusion, Dr. Evans should be congratulated upon the successful completion of a well-arranged and useful volume. GLENTWORTH R. BUTLER, M.D.

A TEXT-BOOK OF HUMAN PHYSIOLOGY. By Austin Flint, M.D., LL.D.

With 316 figures in the text, and two plates. Fourth edition, lately written. New York: D. Appleton & Co., 1888.

Flint's Physiology has for years been justly considered as one of the standard text-books, and this edition will entitle it to hold the same prominent place in medical literature to which its merits had already advanced it. Since the third edition was published in 1880 so many important advances have been made in physiology that it was deemed necessary to rewrite the entire volume. This has been done, and in the volume before us we have a text-book which meets the wants of students and practitioners alike. Some of the changes which we note are the adoption of the new chemical nomenclature, the curtailment of historical references, the discarding of two plates and sixty-three figures, and the introduction of one new plate and sixty-one new figures. For the benefit of those who, by early education and common usage, have long been accustomed to English weights and measures, these have been retained in the text. Inasmuch, however, as scientific works very generally employ the metric system, the equivalents in this system have been given in parentheses. An improved form and typography add to the value of the work.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS. Vol. I., No. 1, January, 1889.

This is the first number of a series of original treatises and complete reproduction in English of books and monographs selected from the latest literature of foreign countries, with all illustrations. The numbers are to be issued monthly at \$1.00 for single copies, and \$10.00 for the year. The series is intended to furnish the busy practitioner with full and complete essays upon the prominent topics of the times in the medical world. While "Abstracts" and "Progress of Medical Science" in the weekly and monthly periodicals serve to direct the attention of the profession to what is being done in the way of discoveries and in practice, these monographs will inform him fully regarding the details of the experiments and methods which have led up to the successes attained—details essential for every one desirous of following the original thinkers in the same line of investigation or practice. To include a sufficient variety of subjects to meet the needs of the greatest number of readers involves the necessity of printing more than one essay in each issue, consequently

there will be supplied to every annual subscriber from twenty-four to thirty-six complete works, the regular selling price of which would be from 75 cents to \$3.50 each, comprising from 2,400 to 3,000 large octavo pages, and including all the plates and engravings which appear in the original works.

In typographical excellence, paper and binding, the publishers promise that these monographs will be examples of the highest class, and will present novel and attractive features never before introduced into periodical literature.

Number 1 of this series we have just received. It contains the Pedigree of Disease, by Jonathan Hutchinson, F.R.S., London; Common Diseases of the Skin, by Robert M. Simon, M.D., London; Varieties and Treatment of Bronchitis, by Dr. Ferrand, Paris.

These three important contributions to medical literature are reproduced, the two latter for the first time in this country, and the last mentioned for the first time in English. The next number will contain "Gonorrhœal Infection in Women," by W. J. Sinclair, M.A., M.D.; "On Giddiness," by Thomas Grainger Stewart, M.D., F.R.C.P.E., etc.; and "A Critical Study of the Clinical Value of Albuminuria in Bright's Disease," by Dr. Pierre Jeanton, Paris, France. If we may judge from the first number of the series, these monographs will be of inestimable value to every physician, and we do not see how any one in active practice, who is desirous of keeping himself informed in regard to the most advanced methods in foreign countries, can afford to be without them.

THE MEDICAL BULLETIN VISITING LIST FOR 1889. F. A. Davis, publisher, Philadelphia.

This Visiting List, which appears for the first time, has a number of novel features. It is arranged upon a plan adapted to the most convenient use of all physicians, and embraces a new feature in recording daily visits not found in any other list. The necessity of rewriting the names of patients every week is obviated, as the arrangement of half-pages requires the transfer of names only once a month; at the same time the record is kept just as perfect and complete in every detail of visit, charge, credit, etc., as by the old method. From this it will readily be seen that a large amount of valuable time is saved, as well as a great deal of labor formerly necessitated in rewriting the patients' names. After eight years' experience and observation in handling and selling every style and form of Visiting List ever placed before the Profession, the publisher thinks that he has produced THE List that Physicians have so long looked and waited for. There are no intricate rulings; everything is easily and quickly understood; not the least amount of time can be lost in comprehending the plan, for it is acquired at a glance.

The List contains a calendar for the last six months of 1888, all of 1889 and 1890; Table of Signs to be used in keeping Accounts; Table of Fees; Dr. Ely's Obstetrical Table; Tables for calculating the number of doses in a given R^x, etc., etc.; for converting Apothecaries' Weights and Measures into Grammes; Metrical Avoirdupois and Apothecaries' Weights; Number of Drops in a Fluidrachm; Graduated Doses for Children; Graduated Table for Administering Laudanum; Periods of Eruption of the Teeth; The Average Frequency of the Pulse at different ages in Health; Formulæ and Doses of Hypodermic Medication; Use of the Hypodermic Syringe; Formulæ and Doses of Medicines for Inhalation; Formulæ for Suppositories for the Rectum; The Use of the Thermometer in Disease; Poisons and their Antidotes; Treatment of Asphyxia; Anti-emetic Remedies; Nasal Douches, Eye-Washes. Following this useful printed matter comes the Visiting List proper, consisting of Blank Pages and Half-Pages, conveniently ruled for recording visits:

Special and General Memoranda, Addresses of Patients, Nurses, and others; Obstetric, Vaccination, Births and Deaths, Records; Bills Rendered, Cash Accounts, etc., etc. Handsomely bound in fine, strong leather, with flap. Compact, light, and convenient for carrying in the pocket. $3\frac{1}{2}$ by $6\frac{3}{4}$ inches. It is published in two sizes—No. 1, Regular size, to accommodate 70 patients monthly or weekly, at \$1.25; and No. 2, Large size, to accommodate 105 patients monthly or meekly, at \$1.50.

DIET TABLES.

Messrs. Reed & Carnrick, of New York, have issued in a book form diet tables for some of the commoner forms of disease, such as fevers, dyspepsia, diarrhœa, dysentery, gout, etc. These tables are printed on leaflets which may be torn off and given by the physician to his patient, or the nurse. On the leaflet for each disease will be found the articles of food which the patient may take, and also those which he must avoid. These tables will be forwarded to any physician who desires them and additional leaflets will be supplied on request. The tables will be found of great convenience to the busy physician and a saving of his time, as he has but to mark the articles of diet that he wishes his patient to take or those which he wishes him specially to avoid.

THE PHYSICIAN'S POCKET DAY-BOOK. Designed by C. Henri Leonard, M.A., M.D. Size, $7\frac{1}{2}$ inches long, $3\frac{1}{2}$ inches wide and $\frac{3}{8}$ of an inch thick. Bound in red morocco for the pocket; pencil loop and flap, red edges. Price \$1.00 postpaid. The Illustrated Medical Journal Co., Publishers, Detroit, 1888.

This is the tenth year of issue of this day book, which contains several new features. Besides accommodating daily charges for thirteen months for fifty families, and the other usual memorandum pages, it has a very complete list of Doses of Old and New Drugs; Poisons and Their Antidotes, Tried Tests for Urinary Deposits, Chemical and Microscopical; Obstetric Calendar; Disinfectants for the Sick-Room and Vaults; Tables of Weights and Measures; Table of Eruptive Fevers, and Drops in a drachm of fluid medicines.

MISCELLANEOUS.

TO MEDICAL MICROSCOPISTS.

In behalf of "The American Association for the Study and Cure of Inebriety," the sum of One Hundred Dollars is offered by Dr. L. D. Mason, Vice-President of the society, for the best original essay on "The Pathological Lesions of Chronic Alcoholism Capable of Microscopic Demonstration." The essay is to be accompanied by carefully prepared microscopic slides, which are to demonstrate clearly and satisfactorily the pathological conditions which the essay considers. Conclusions resulting from experiments on animals will be admissible. Accurate drawings or micro-photographs of the slides are desired. The essay, microscopic slides, drawings or micro-photographs are to be marked with a private motto or legend and sent to the chairman of the committee on or before October 1st, 1890.

The object of the essay will be to demonstrate: First, Are there pathological lesions due to chronic alcoholism? Second, Are these lesions peculiar or not to chronic alcoholism?

The microscopic specimens should be accompanied by an authentic alcoholic history, and other complications, as syphilis, should be excluded.

The successful author will be promptly notified of his success, and asked to read and demonstrate his essay personally or by proxy, at a regular or special meeting of the "Medical Microscopical Society" of Brooklyn. The essay will then be published in the ensuing number of *The Journal of Inebriety* (T. D. Crothers, Hartford, Conn.) as the prize essay, and then returned to the author for further publication or such use as he may desire. The following gentlemen have consented to act as a committee: Chairman, W. H. Bates, M.D., F.R.M.S., London, Eng. (President Med. Microscopical Soc., Brooklyn, 175 Remsen St., Brooklyn, N. Y.; John E. Weeks, M.D., 43 West 18th Street, New York; Richmond Lennox, M.D., 164 Montague St., Brooklyn, N. Y.

KINGS COUNTY MEDICAL ASSOCIATION.

The following officers have been elected to serve during the year 1889: President, E. R. Squibb; Vice-President, T. M. Lloyd; Recording Secretary, J. C. Bierwirth; Corresponding Secretary, S. H. Benton; Treasurer, J. R. Vanderveer; Executive Committee, R. M. Wyckoff.

METHODIST EPISCOPAL HOSPITAL.

Members of the medical profession are invited to attend the surgical service of the Methodist Episcopal Hospital daily, except Sundays, from 2 to 4 P. M. Dr. Pilcher will be in attendance on Mondays, Wednesdays and Fridays; and Dr. Fowler on Tuesdays, Thursdays and Saturdays.

CONTAGIOUS DISEASE HOSPITAL LAW.

An Act to authorize the Department of Health of the City of Brooklyn, County of Kings, to establish hospitals for contagious and infectious diseases and in relation to the erection, government and maintenance thereof.

Passed March 9, 1887, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly do enact as follows :

SECTION 1. The Mayor with the Commissioner of the Department of Health and the Commissioner of the Department of City Works of the City of Brooklyn are hereby constituted a Commission with power and authority by this act to select a site in or near the City of Brooklyn, County of Kings, for the erection of public hospitals for the reception and treatment of persons suffering from infectious or contagious diseases.

SEC. 2. After such a site has been selected as aforesaid, it shall be purchased at a fair market value or leased by said Commissioners.

SEC. 3. The Board of Estimate of the City of Brooklyn is hereby authorized to include from year to year in its annual report the sum or sums necessary for the purchase or lease of said site, and for the erection and maintenance of said hospitals, and the sum or sums so reported shall be included in the annual tax levies of said city.

SEC. 4. After such site has been selected, as aforesaid, either by purchase or lease, and whenever funds have been provided, in the manner aforesaid, the said Commissioners are empowered by this act to take such property by purchase or lease, in the name of the City of Brooklyn, after the Corporation Counsel shall have approved the validity of the title to the same.

SEC. 5. The management of said hospitals shall be under the direction and control of the Commissioner of the Department of Health of the City of Brooklyn.

SEC. 6. The said Commissioner of the Department of Health of the City of Brooklyn shall make rules and regulations for the conduct and government of said hospitals. He shall appoint all physicians, who shall be doctors of medicine holding degrees from medical colleges in good standing. He shall appoint employees, nurses and servants, as may be necessary, and determine their salaries, and shall regulate the scale of prices for those who are able to pay for admission and treatment. But no person having an infectious or contagious disease shall be refused admission to these hospitals because of his or her inability to pay.

SEC. 7. The Commissioner of the Department of Health is hereby authorized to cause to be removed to these hospitals any person or persons afflicted with contagious or infectious disease whose house and sanitary surroundings are not satisfactory to the said Commissioner.

SEC. 8. All moneys received from patients treated in these hospitals shall be paid into the City Treasury.

SEC. 9. This act shall take effect immediately, and all acts or parts of acts conflicting with the same are hereby repealed.

GLANDERS.

The following letter, upon the subject of glanders as an infectious disease and the propriety of killing animals suffering from said disease or farcy, as soon as recognized, is published for the information and guidance of the U. S. Army:

BALTIMORE, July 24, 1888.

To the Quartermaster-General U. S. Army,

Washington, D. C.

GENERAL: In reply to your communication of July 19th, I have the honor to submit the following statements and opinions:

Glanders is an infectious disease in which the infectious agent has been demonstrated to be a living micro-organism—a bacillus.

The bacillus of glanders was discovered by the German bacteriologists, Löffler and Shutz, in 1882, and the discovery has since been confirmed by several other competent bacteriologists. It is found in the nasal secretions and ulcers of the mucous membrane, in the "farcy-buds" pustules and enlarged lymphatic glands of infected animals, and it is probable that it is also sometimes present in the urine.

It is a slender rod, somewhat similar in appearance to the well-known tubercle bacillus, but more uniform in size and somewhat broader. In preparations stained with fuchsin or with Löffler's solution of methylene blue, clear spaces are often seen in the rods, which have been thought by some authors to be spores, but this is doubtful,

as Löffler has found that no development occurs after the bacilli have been exposed to a temperature of 55° C. (131° F.) for ten minutes.

Pure cultures of this bacillus have been shown to produce typical glanders in horses and asses, and it is recognized by bacteriologists as the cause of the disease. The disease may also be transmitted by inoculation to Guinea-pigs and to field-mice, which animals (preferably Guinea-pigs) may be used as a test of the infectious character of the nasal secretions of a suspected animal.

Exact experiments have shown that the bacillus of glanders is killed by exposure for five minutes to a 5 per cent. solution of carbolic acid, or by a 1 to 5000 solution of corrosive sublimate.

In practice it will be best to rely upon boiling water for the disinfection of all articles which can be immersed in it without injury—rope halters, blankets, currycombs, bits, etc. To keep on the safe side, half an hour may be fixed as the standard time which articles to be disinfected shall be immersed in boiling water, or exposed to steam at a temperature of 212° F.

Articles of leather should be repeatedly washed with a 5 per cent. solution of carbolic acid or a 1 to 1000 solution of corrosive sublimate; or immersed in such a solution for at least one hour. If the solution can be used hot, say 180° F., without injury to the material, this will be desirable.

All exposed parts of an infected stable should be thoroughly and repeatedly (three or four times) washed with a hot solution of one of the above-named disinfectants. The carbolic acid solution (5 per cent.) will be preferable on account of the poisonous nature of the solution of the bi-chloride of mercury; but the latter is less expensive, and under proper supervision there should be no special danger in using it. After its use, feeding-troughs, etc., should be thoroughly scrubbed with hot water to remove all traces of the poisonous salt. The application of a lime-wash to all surfaces, after complete disinfection, will be desirable.

Stables occupied by infected or suspected horses should be disinfected daily by washing exposed surfaces with a 5 per cent. solution of carbolic acid, and nose-bags, halters, buckets used for drinking-water, etc., should be carefully washed with the same solution or with boiling water.

In view of the reliability of known measures of disinfection, when properly executed, I do not consider it necessary or justifiable to destroy Government property of value which has become infected by contact with animals suffering from glanders.

I do not doubt the propriety of killing animals suffering from glanders or farcy as soon as the nature of the disease is recognized.

Very respectfully, your obedient servant,

GEO. M. STERNBERG,

Major and Surgeon, U. S. Army.

THE
BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

EDITORIAL COMMITTEE:

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VOL. III., No. 2.

BROOKLYN, N. Y., FEBRUARY, 1889.

WHOLE No. 14

ORIGINAL ARTICLES.

THE IMPLANTATION OF THE TEETH OF MAN,
IN THE JAWS OF MAN.

The origin of the operation ; methods of procedure ; anatomy of the maxillæ ; treatment of attendant and subsequent diseased conditions ; consideration of the prevailing theories of repair ; cases from practice.

BY RODRIGUES OTTOLENGUI, M.D.S.

The origin of the operation.—The operation of *implantation* was first performed by the eminent surgeon, John Hunter. I am aware that this statement will cause surprise, and yet such is the fact. To Dr. Younger belongs the credit of first implanting a tooth *in the jaws of man*. The initial operation was undoubtedly *replantation*. This means the replacement of a tooth into a socket from which it has been accidentally, or intentionally, removed. Probably the possibility of reunion under such circumstances was first observed through accidental displacement, and subsequent replacement, by the subject ignorant of the possibilities or probabilities in such conditions. A similar circumstance came to my knowledge some years ago. Two gentlemen, standing one evening on a Broadway corner in New York City, were approached by a beggar, who, on being denied, struck one of the men a blow which felled him to the pavement, and darted down

the cross street. The companion of the assaulted man started in pursuit and overtook the ruffian, who, stopping suddenly, wheeled and struck his antagonist across the mouth with a sand club, eventually escaping. The blow displaced the two central incisors, which fell to the pavement. Mr. G—, missing his teeth, searched for and found them. He hurried home, thoroughly washed the teeth and bleeding sockets with warm water, gently pressed the teeth back into position, and retired. With the exception of a slight soreness during a few days, he suffered no inconvenience for two years after this, when, however, he discovered a swelling about the extremities of the roots, accompanied by much pain, and was directed to me for professional service. I drilled into the teeth and removed the dead pulps, opened the abscesses, releasing considerable pus, and subsequent treatment effected a cure. The teeth are sound and firmly attached at this time, six years after the accident. I think some such case as this first brought the possibility of this operation to the notice of practitioners. It has been frequently resorted to as an effectual way of removing an abscess sac, the tooth being returned to its position.

A step beyond this was practiced as early as the end of the sixteenth century if not before, and many cases are reported where teeth were *transplanted*. That is to say, a tooth from one mouth was placed into the jaw of another person. In these operations it was deemed necessary to extract a root or defective tooth, from the recipient, a sound and healthy tooth being at the same time removed from some unfortunate (more in need of money than a tooth), and this newly extracted tooth was pressed into the fresh socket of the subject. It is evident from this that the expectation was an attachment of the inserted tooth similar to normal conditions.

Hunter evidently wished to test the nature of this union, and being unable to procure a specimen from the human, he conceived the idea of *implanting* a tooth into the comb of a cock. In the language of to-day this was strictly speaking *implantation*. *He did not take a tooth from one socket and place it into another. He made artificially a socket in the comb of the cock, inserted a tooth and held it by ligatures.* This is precisely what is done to-day in the jaw. It seems remarkable that this difference between Hunter's operation and the one then in vogue, *transplantation*, should have remained unrecognized until Younger's courageous experiment. In fact, as far as I know, this is the first time that the fact mentioned, viz., that Hunter *implanted*, has been noted at all.

There is a vast difference, however, between cutting a slit into a cock's comb and drilling a hole in a man's jaw, and credit is due to Dr. Younger for conceiving and pursuing such a course.

Dr. Younger first implanted a tooth on June 15, 1885, therefore the data of this operation must be taken within the comparatively brief time which has since elapsed. Histories and records of *replanted* and *transplanted* teeth have only a *comparative* value, and a greater knowledge of histology, and I may say of embryology, than is at present possessed by any one is needed to properly compute the relative worth of such testimony.

There is another point of knowledge emphasized by Dr. Younger's work which is of value and interest. That is that *freshly extracted teeth are not necessary as was formally held*. This, however, was not entirely unsuspected, even before Younger entered the field. Garrettson reports a case¹ where a tooth was replanted after having been carried by the patient in his trousers' pocket amongst keys and small rubbish. It is now known, however, that a tooth will be received and retained (for a time at least) within a freshly made socket after having been out of the mouth even so long as twenty years. Teeth have been used which have been imbedded in plaster models of the mouths from which they were taken, the date of extraction having been recorded on the models. I know of such a tooth which has been in position for two years. I believe, however, that it will be lost, as there are now present a fistula and discharge of pus, which do not yield to treatment.

Methods of procedure.—Dr. Younger's method as first given to the profession was to keep his teeth, which he proposed using, dry, but to bathe them for a few minutes in a solution of bichloride of mercury (1 to 1000) at the time of the operation. He entered the foramen and removed the dead pulp, then filled the canal with gutta percha to within one-sixteenth of an inch of the apex, finishing the filling with a combination of gold and tin (equal parts).

Without dilating at this point on this process, it will suffice to say that different operators to-day vary the method of filling the roots; some enter through the apex, necessarily enlarging the foramen, whilst others prefer to drill through the crown, thus leaving the apex undisturbed. All the various materials used in filling canals in the mouth are resorted to in this portion of the preparation of roots out of the mouth. The main points, however, are whether to fill entirely with gutta percha, or to imitate Dr. Younger and conclude the filling with gold. I will discuss this later.

The next point is to make the incision through the soft tissues. Dr. Younger, I believe, makes a cross cut, dissecting back the four flaps. Dr. Kirk makes a single incision dissecting the tissue loose

¹ Oral Surgery. — Garrettson.

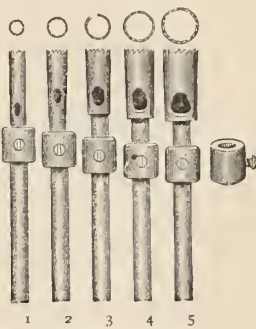
from the bone, thus allowing it to impinge on the tooth when placed and (perhaps) assist in retaining it. Dr. Curtis invented instruments specially adapted to his method. He uses first a curved chisel, which with three cuts will inscribe a circle, and the tissue within this circle he removes with what he calls a "denuder," which is a hoe-shaped instrument, the sides of which are keenly sharpened. Thus Dr. Curtis removes a portion of the gum tissue. Dr. Rollins also advocates this method and introduced for this purpose a tubular knife (Fig. 1), to be used in the dental engine. This instrument makes a clean, perfectly circular incision, and may be pressed down to the bone with little pain, if rapidly revolved. The tissue within may then be removed either with a denuder, as

FIG. 1.
TUBULAR
KNIVES.



3

FIG. 2.
TREPHINES.



suggested by Dr. Curtis or with a bistoury. For drilling the sockets, Dr. Younger first used the burs ordinarily employed for dental operations. As, however, he became satisfied that his operation was to become a general practice, he devised instruments specially adapted to

FIG. 3.
REAMERS.



1

2

3

the work. These consisted of trephines and reamers. The former are figured in Fig. 2, and the latter in Fig. 3. The set screws and collars sliding on the shafts of the trephines, as shown in the cuts, were suggested by Dr. Walker. Their use is to mark the depth to which it is desired that the socket shall be cut. The collar being thus set, the trephine, revolved in the dental engine is pressed into the bone of the process, until the collar touches the gum, when it is withdrawn. The result being a cylindrical hole, it is necessary to use the reamers (Fig. 3) for final shaping of the socket.

Fig. 4 shows the instruments suggested by Dr. Rollins as being best adapted to the work. These also have the sliding collar and set screw. No. 1 has two blades. In use it is pressed into the bone to the required depth, which is regulated as in the Younger-Walker instruments. No. 2 is similar, but more conical, and is used in the hole previously made, and swayed from side to side to enlarge the cavity to fit the root.

FIG. 4.
IRAL KNIVES.
1 2



Dr. Ottogy suggested what he called a "crib-knife." This was shaped like a cage, the debris passing between the three knives which formed the bars of the cage. Doctors Curtis and Kirk have devised instruments to suit their individual ideas of this operation. These consist of conical and round coarse burs of different sizes, having various numbers of blades.

As will be readily recognized, it is essential that an implanted tooth should be firmly fixed in position until repair has occurred.

Dr. Younger relied on ligatures for twenty-four hours, after the lapse of which time he deemed it safe to take an impression, from which he made a model of the parts. He then constructed of gold a band to fit the palatal sides of at least three teeth, including the implanted one, and this splint he held in position with ligatures passed through holes and tied around the teeth. Dr. Kirk depends mainly on the wire ligature, which is more successful in his hands than it would be in those of other operators, because of his great skill in placing it, which is very difficult. Dr. Curtis has a method which is original and effective. He enters the canals of the teeth he implants through the crown, and in filling forces one end of a "U"-shaped platinum staple into the canal. Or, to be more exact, the staple resembles an L turned upside down (┐), and the long end enters the canal, the short end reaching the adjoining tooth where it is retained by a filling.

I shall now criticise these methods, and so explain how I have come to adopt my own way of performing this operation. I may say at the outset that I have tried all the various methods and nearly all the instruments. Those specially devised and not in the market have not been within my reach.

First as to filling the canals: I prefer to enter through the foramen, unless a cavity already exists in the tooth selected, which need rarely be. I have so decided because I find no evil results from such procedure; whereas, if a hole is drilled through the crown, an unnecessary destruction of a portion of the tooth is made, the subsequent filling, however perfect, not being as good as the tooth substance removed. I fill the canals to the apices with gutta-percha for the following reasons. Long experience has shown that the alveolus will tolerate gutta-percha, as a foreign body, better than it will any other known material; this has been discovered where accidentally root fillings have been pressed through the foramen projecting into the surrounding territory; drill holes accidentally made through the sides of roots have been more successfully capped over with gutta-percha than with any metal.

Next as to instruments: At the outset I must say, that I prefer to

remove a portion of the gum. If this is not done either with the intention of the operator, or accidentally whilst using his drilling and burring instruments, it is readily seen whether a single or a cross incision be made, the result will be that a superfluity of tissue will remain, which, impinging on the tooth, must be removed, and that this will probably be affected by sloughing, causing suppuration and eventual recession of what is meant should be the margin of the gum about the new member. I must not be understood as saying that evil results of the kind indicated would invariably result, but I attribute the poorly shaped margins which I have seen about the necks of teeth, implanted by advocates of this method, to this practice. From the first I have used the tubular knife (Fig. 1) of Dr. Rollins, believing that with it I could better form a correct curve to my margins, especially at the labial aspect. I have been very successful in this, the only comparative failure being in one instance, where, owing to the small diameter of the tooth root, not having a Rollins' knife to correspond, I used my bistoury. In this case I obtained a greater exposure of the root than is desirable. Having dissected away the gum and so exposed the alveolus, the next step is to drill into the bone and form the socket. For this I have used and abandoned all the instruments shown in the accompanying cuts. My objections are as follows: Dr. Younger's trephines frequently cut into the bone and on removal *leave the "core" still attached to the alveolus*. This leaves us but little advanced in our work; it becomes a difficult thing to remove this core, and involves pain to the patient. The Rollins' instruments do not cut well enough either laterally or in drilling ahead. Their action seems more one of *compression* than of *cutting*; their use is quite painful to the majority. The reamers (Fig. 3) are too fine, and at the same time too coarse; that is, they have too many blades (11), and are harsh in lateral cutting since the entire length of the blade is presented against the bone. The result in my case has been little cutting and much pain. My objections to these instruments, expressed in brief, would be: they are inadequate to the work, being unreliable and inexact in their

FIG. 5.

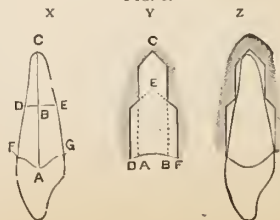


No. 1.

No. 10.

action. By the last phrase I mean that, at least in my hands, it became necessary to judge of the shape of the socket being made, by the eye, and experimental trials of the adaptation to the root to be placed. If at such a trial the root could not be pressed into position it became a difficult matter to determine whether it were necessary to *deepen* or *widen*

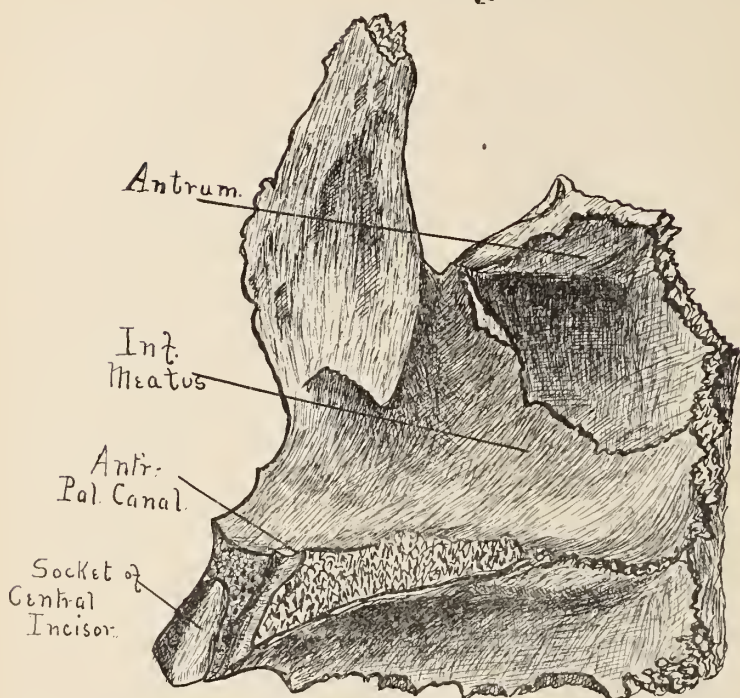
FIG. 6.



the socket. I had performed the operation twenty-five times when I concluded that such procedure with such instruments was unnecessary butchery, and not scientific surgery. I determined not to operate again till I discovered a better method. After many experiments I finally had constructed a set of ten instruments, as shown in Fig. 5. This instrument is a combination of drill, bur, and reamer. It is provided with nine blades, of which only three reach the conical apex, thus ensuring rapid forward drilling. The blades at the sides are subdivided into teeth, so that though more rough in appearance, it really cuts cleaner than the Younger reamer in lateral work. In the sliding collar there is also an improvement, the set screw, an awkward device, giving way to a slit in the collar which is sprung into position on the shaft. In operating, two sizes of my instruments are needed. Holding a tooth, as shown in Fig. 6, x, I select an instrument whose diameter equals that of the tooth at D, E, and set the collar distant from the apex equal to A, C. This is carried into the bone and forms a cut, as shown at A, C, B (Fig. 6, y). It is now known positively: first, that the socket is deep enough; and second, that it is wide enough at the upper third to receive that portion of the tooth above the line D, E. The second instrument is chosen with reference to the diameter at F, G (Fig. 6, x), and is pressed into the socket only as far as B. The result of this last is shown at D, E, F (Fig. 6, y), and the tooth in place is seen at Fig. 6, z. In examining this last figure, the socket will seem to touch the tooth only at four points (sectionally viewed), but this is only diagrammatical. In the operation the second reamer is usually chosen a trifle too small, and the conical shape obtained by swaying the instrument and consequent lateral cutting. I have thus implanted a tooth in a beef bone in three minutes, and section showed the tooth and socket in close juxtaposition throughout. I have implanted a tooth in the jaw in six minutes, which fitted so snugly that it needed no splint to retain it. The tooth will be shown in a drawing further on. (Fig. 31, the first bicuspid, left side).

The anatomy of the maxilla.—The anatomy of the jaws becomes a point of vital interest to those who undertake this operation. I have failed to find any drawings in our text-books which sufficiently show these parts. I therefore obtained a number of bones, made sections of the same in various directions, and have chosen the ones from which I made the accompanying drawings to illustrate the points which I think it essential to know.

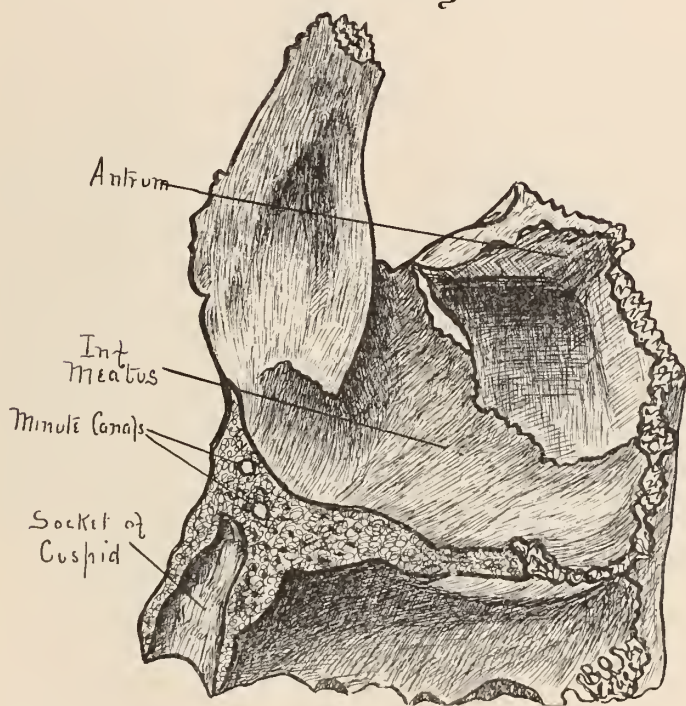
Fig. A is the superior maxilla. Section was made through the centre of the central incisor socket and through the anterior palatal canal. A portion of the bone has been broken away so as to more thoroughly expose the antrum. Examination of the plate will demonstrate the value of the following suggestions:

Fig. A.

The labial plate of the alveolus is very thin in the normal socket (cent. incs.) It should be so made in the drilled socket, care being taken to avoid cutting through to the gum, however. The direction of the palatal canal is an angle a trifle greater than that of the socket, and yet the slant of the adjacent teeth may be taken as a guide. The chances of entering this canal are conspicuously present in two conditions, first where the teeth originally were prominently forward, and it is desired to set the new members less so. The temptation here would be to bur the socket backward towards the palate, and this would be towards the canal. In this operation the end may be safely attained if in reaming backward care be taken to work towards the lateral incisors and away from the median line. It is better to set the teeth with a slight tip or with a trifling intervening space than to risk rupturing the vessels in this canal (see Case 2, Fig. 31). The other condition is where the space between the laterals is wider than can be filled by two teeth. The temptation here, for appearance sake, is to set the centrals close together, leaving spaces between them and the laterals rather than to have all the space between the centrals. This in many in-

stances would, however be risky. Such a case was presented to me for operation at a clinic, and I was criticised for setting the teeth as I thought safest, with a space at the median line. If, in such a case, it be noticed that at the median line a well-marked ridge of the gum is continuous with the frenum extending over into the roof of the mouth,

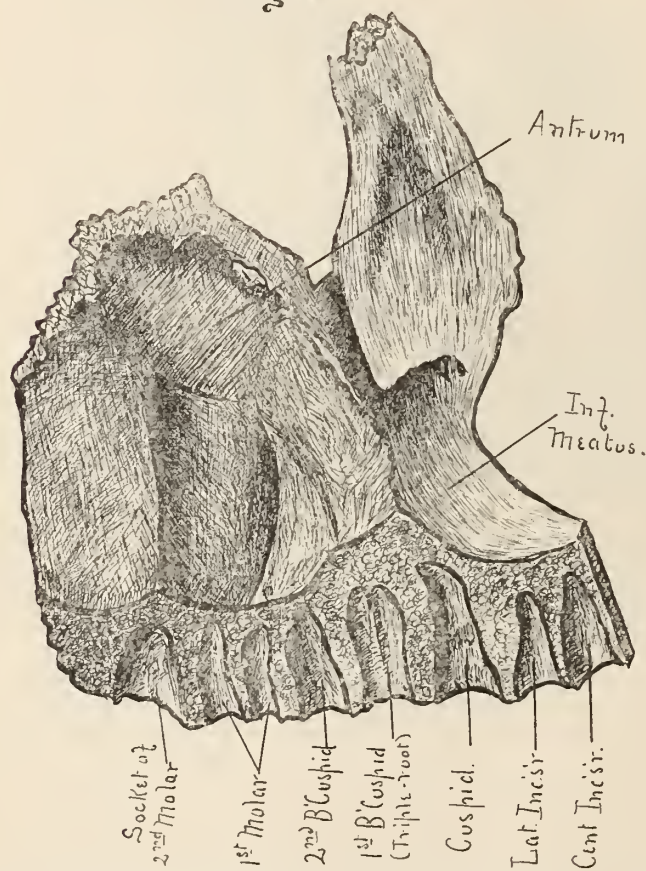
Fig. B.



there becoming the central line of the rugæ, it may be taken as certain that originally a space existed, the maxillæ not being closely united and the canals being probably large. Such was the case in the clinical operation alluded to, and such my conclusions, the existence of space originally, being verified by questioning the patient. Care of course should be taken not to select a tooth with so long a root that drilling a socket would endanger the cavity of the nares which is not distant.

Fig. B shows a section through the centre of the cuspid socket. The points of interest shown by this illustration are the comparative absence of danger of entering either the nares or the antrum. Of a large number of sections made, the two canals shown in this drawing are the only ones I have been able to discover at any point within the bone. We know, however, that a complete vascular supply exists, as

Fig. C.



any one who has ever enjoyed the midnight companionship of an aching tooth would testify. An excellent drawing showing this interosseous system can be found in Gray's Anatomy (Fig. 344), or the same plate may be seen in The American System of Dentistry, vol. 1 (Fig. 143). I believe I am correct in saying these vessels have no fixed canals, but penetrate the bone of the process. I call attention, therefore, to these two canals which I discovered (they can be traced but a very short distance with a bristle), because their presence seems to indicate that in

the cuspid region the nerves are larger than elsewhere. The nerve comes down from the region of the antrum, and divides into posterior and anterior dental, immediately over the cuspid, and I consider the two canals shown as containing these nerves. Great care should then be taken not to drill too deeply even in this apparently safe region. On one occasion I am sure that I touched one of these nerves, and the result was a painful neuralgia, persisting till antipyrin was exhibited.

Fig. D.

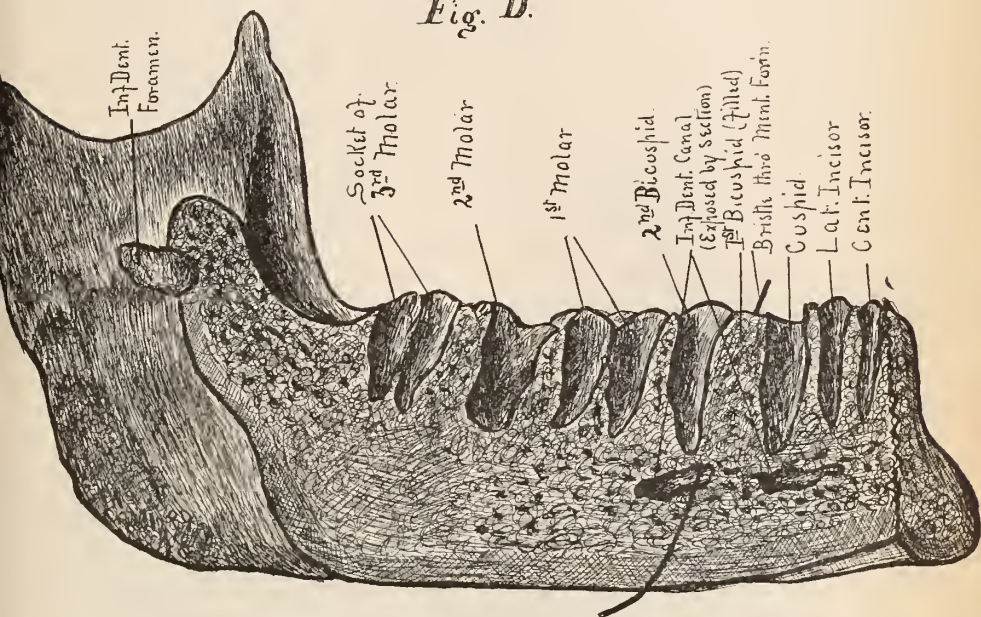


Fig. C is a section through the centre of all the sockets of the teeth, the palatal portion of the bone being removed. The relative positions of the extremities of the teeth and the cavities of the nares and antrum is here readily seen. The bicuspid, especially the second, are the teeth we are most often called upon to implant, and yet they are the ones offering the greatest danger, the proximity to the floor of the antrum being so difficult to determine. I suggest, as a slight guide, the fact that the lower portion of the malar process, readily found with the finger, is one floor of the antrum, though *not the lowest*.

Fig. D is a section of the lower maxilla, the lingual portion of the bone having been removed. It will be seen that, though section has been made through the centre of the sockets, the dental canal has been exposed only in the bicuspid region. In the molar region the canal curves forward, and occupies a position not in the centre of the bone

but nearer the outer surface. Therefore, in the implantation of lower molars, it will be safer to slant the burring instrument towards the tongue, rather than to drill straight down and risk rupturing any of the very important vessels in this canal. In the bicuspid and cuspid region the canal is directly under the teeth, and in the incisive region it is lost in the bone, no complete canal being seen. Immediately behind the central incisors, on the median line, I have found in all my specimens foramina analogous to the anterior palatal in the upper bone. These are not figured in Gray or any other work which I have seen, but seem to be constant in the bones. It would seem probable, therefore, that small branches of the vessel here find an outlet and supply the adjacent soft tissues.

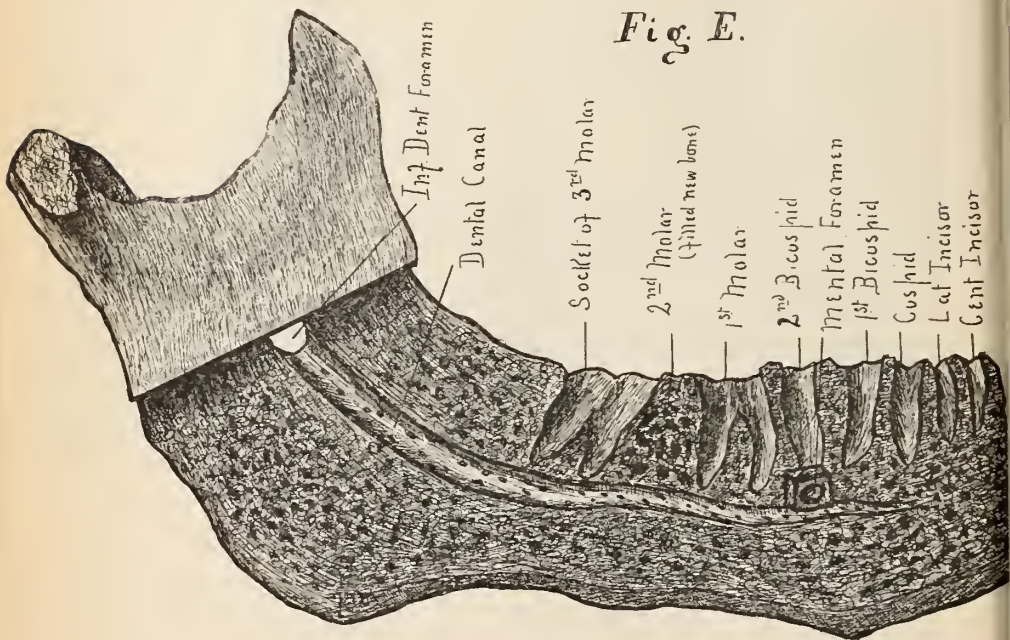


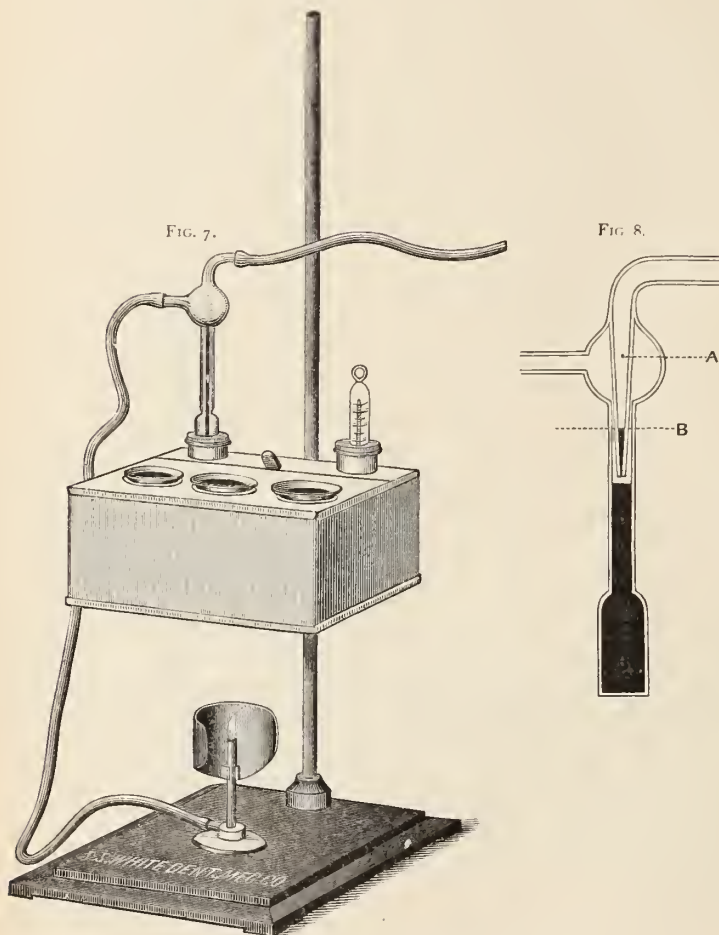
Fig. E is a section of the lower maxilla, the buccal portion of the bone having been removed. In this case the dental canal is seen throughout, as it is in this portion of the bone that it lies. I consider that I have been most fortunate in securing this specimen, as it emphasizes an opinion I had formed from clinical experience. On one occasion, in drilling a socket under the antrum, (though as I was to implant a *first* bicuspid this did not seem probable), I first noticed great resistance, the bone being quite dense; suddenly my instrument darted forward as though having passed through a thin layer, and before I could prevent it I had entered the antrum. If the reader will examine the

appearance of the socket of the second molar in Fig. E, it will be seen that a dense superficial layer of bone covers what in the rest of the original socket is the most cancellous portion of the whole bone. This possibility, not always present (see Fig. D, socket of bicuspid), should be borne in mind, and great care taken during the operation to prevent such an accident as I have outlined.

Treatment of attendant and subsequent diseased conditions.—It sometimes occurs that a root in the mouth is so diseased, either from pyorrhea alveolaris or abscess, that its removal becomes a necessity. In such a case, should it be decided to implant another tooth in the place of the lost member, the following methods are to be observed. The tooth must not be placed in the diseased socket, even though it be of proper size for ready introduction. The reamer must be used freely, the socket being enlarged in all directions, until there is a certainty that no surface of the original socket be left remaining. If the condition which caused the extraction was abscess, a round bur must be used in the extremity of the socket, removing the sac if it has become detached from the root (as frequently occurs), and all soft or diseased tissues. If there be hypertrophy about the fistula, it should be removed with scissors, and if necessary a stitch taken. If there be no fistula, but a congested condition of the gum exists, the parts should be stimulated by a slight application of a saturated solution of salicylic acid in alcohol.

During the operation in such condition, or where the parts are healthy, the following antiseptic precautions are advisable, if not imperative. The hands, and especially the nails, of the operator (and assistant, if there be one) should not only be scrupulously clean, but should be specially cleansed just before the operation. For this purpose I use a hot solution of hydronaphthol in water (1-300), a stiff nail-brush, and castile or glycerine soap. A commodious glass bowl should be on the operating bracket, partly filled with the hydronaphthol solution; into this should be placed all the drills, reamers, burs, bistouries, and syringes to be used in the operation; also a number of small pieces of fine sponge. The tooth meanwhile having been prepared and the root filled, rests in a little glass bowl partly filled with a solution of bichloride of mercury (1-1,000). As often as a bur is changed, the assistant should cleanse off blood and bone debris and return to the bowl containing hydronaphthol. This preparation is used for the instruments, as it is non-corrosive. For cleansing the socket a warm solution of the hydronaphthol may be used in rubber bulb syringes. The pieces of sponge are pressed into the socket occasionally, and being withdrawn bring away the bone chips. The sponge should be thrown away and a fresh piece taken when again needed. In the final placing of the

tooth the hands of the operator should be once more thoroughly cleansed, a piece of sponge remaining in the socket during this space of time; this done, the hands should be saturated with the bichloride solution and the tooth placed in position with the fingers. A slight



amount of blood will ooze out as the tooth is placed. It has been my practice not to remove this, but to apply about the neck of the tooth a paste of glycerine and tannin, which with the blood forms an insoluble mass, and I believe prevents the ingress of bacteria. It is to this practice that I attribute the fact that since its adoption I have not had any suppuration of the margins. This clot will be adherent for two days, and may be removed at that time if advisable.

I keep my teeth moist, preserving and sterilizing them in a solution of mercuric iodide of potassium (1 gr. to 6 oz. water, 1 oz. alcohol).

The majority of operators keep the teeth dry and sterilize at the time of using. To those who do so nothing could be better than the device of Dr. Kirk (Figs. 7 and 8). Dr. Kirk describes it as follows:

"The apparatus (Fig. 7) is a simple copper box, nickel-plated, with a lid perforated with three holes for the reception of three glass vessels; in one of which you have your mercuric chloride solution, 1 part to 1,000; in another, distilled water; and in the other I like to have a somewhat stronger solution of mercuric chloride, about 1 part to 500, for instruments or wiping out the socket. I want to be sure that my instruments are absolutely sterilized, so that they cannot possibly convey any specific taint from one patient to another, and also that micro-organisms of whatever character may be completely excluded as a factor in the operation, whereby undue inflammatory action may be avoided and union by first intention induced. So I have this stronger solution at hand for wiping off my instruments and sterilizing them. A thermometer is attached to the bath, and also a thermostat of my own devising. This thermostat (see Fig. 8) can be set at any desired temperature. The gas passes from the street main through the tube at the top of the bulb, and passes down through the contracted neck, terminating in an end which is ground off at an acute angle. There is a small hole or orifice (A) on the side of this inlet-tube within the bulb which will allow only enough gas to pass to barely keep the little Bunsen burner alight. The lower portion of the instrument is a bulbous expansion filled with mercury. When the temperature in the bath rises to the degree at which the mercury is set (and for these operations I use 103° F.), it gradually expands and closes off the flow of gas from the free end (B) of the delivery-tube, and the flame of the burner as the mercury rises towards B goes slowly down, but not out, as the small orifice in the side of the delivery-tube allows enough gas to pass to keep the burner alight. It is perfectly automatic in its action. By this means, after the bath has reached the temperature at which the thermostat has been set, the water is kept at a constant temperature, and the tooth that I am to use can remain in the bath without thought on my part as to its being overheated."

I have not adopted this apparatus because I believe it better to keep the teeth moist. Teeth kept dry are sure to split and become friable. I followed this, the commonly advised practice, until one-third of the crown of a central incisor broke off about three months after I had implanted it. I replaced the fractured portion, fastening it with delicate gold screws, but do not court such another accident.

I have alluded to the methods of splinting. In my own practice I have used various kinds, but prefer one of the following, as the case

may demand. A removable splint, consisting of a vulcanized rubber plate, covers the roof of the mouth and the crowns or incisive ends of the implanted tooth and one on each side. This keeps the tooth firmly in position and being removable may be dispensed with gradually, the patient after a time wearing it only at night, and finally not at all. This is, I believe, my own idea, though not at all remarkable. The fixed splint is a gold plate struck up to accurately cover the crowns and sides of three teeth, and is cemented into place. This was also original with me, though I accidentally discovered to-day that it was suggested as early as two years ago by Dr. Ottofy. Such ideas, however, are a part of a dentist's necessities. Original devices to meet special cases are constantly demanded.

Of subsequent diseases, next to nothing has been done by way of treatment. I am at present caring for two patients who had teeth implanted two years ago by a professional friend. In both cases the teeth are firmly attached apparently by ankylosis, but fistulæ have appeared from which there is a constant discharge. In one case there has never been any bone formed over the labial portion of the root, and the discharge seems to come from the soft tissues. I am stimulating the parts, and shall probably attempt to close the opening by sponge grafting, if simpler methods do not succeed. In the other case I believe the trouble has arisen from a blow. The adjoining tooth was implanted at the same time and is entirely healthy. I have thus far been using arom. sulph. acid injection once per week, and every second day washing out the tract with peroxide of hydrogen and bichloride of mercury (500:1). This case seems improving, but should it not entirely recover shortly, I propose entering with a bur and removing the roughened end of the root, which I am sure is absorbed, though it has been difficult to discover this definitely, since the parts are extremely sensitive and the patient anxious and nervous.

I insert here some illustrations of the appearance of teeth lost by absorption, which had been transplanted prior to the introduction of Younger's method. I will abstain from comment. These illustrations are from an article in "Dental Cosmos," by Dr. Weld.

Fig. 9.—C, D, E show the manner of absorption of a root of *transplanted* tooth after eight months.

Fig. 10.—Inferior right third molar, extracted and replaced, after which it was worn five years and two weeks without being lame, until three days before last extraction. A is a large cavity formed by the absorption after the tooth was replaced; B, gold filling.

Fig. 11.—Another view of the same tooth; letters as before.

Fig. 12.—Section of the same tooth, to show the extent of cavity

A, in Fig. 2; C, dentine; E, enamel.

Figs. 13, 14.—Two views of a tooth which was extracted and re-placed, but after being used two years was again removed; letters as in former figures.

Figs. 15, 16.—Two views of a tooth which was extracted and re-placed; letters as before.

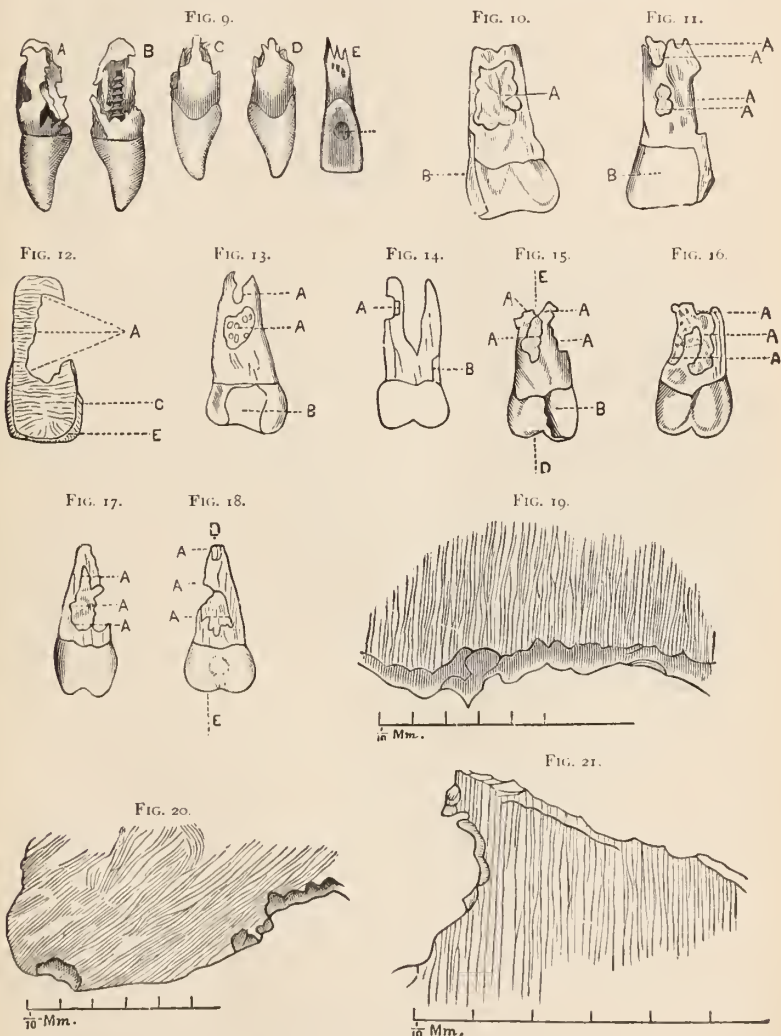


Fig. 17, 18.—A reinstated molar; letters as before.

Fig. 19.—Section from tooth shown in Figs. 2, 3, 4; shows marks of absorption. Section corresponds to the deep surface of the cavity A, in Figs. 2 and 4.

Fig. 20.—A section from a tooth shown in Figs. 5, 6; plainly to be seen are the marks of absorption.

Fig. 21.—Section through the line D, E, Figs. 7 and 8, perpendicular to surface shown in Fig. 7. The lunated edge corresponds to the deep surface of the cavity A, in Fig. 7.

A consideration of the prevailing theories of repair.—Under this caption it was my intention to have given an extended résumé, but as by the profession at large this is still considered an open question, I shall only quote a brief paper of Dr. Curtis's which gives the theory generally accepted at the present time. Younger's idea at first was that the pericementum was revived, and he quoted occurrences which seemed to verify this, but it is now considered that this is erroneous. A second theory is a contraction of the alveolus, causing a mechanical retention. A third is that osseous tissue is deposited around the root, which might also be considered a mechanical attachment. The fourth theory is that a true ankylosis occurs, and this rests on the testimony of Dr. Curtis which I give, and on somewhat similar observations of others.

As the length of this paper is already great, I prefer not to say anything at this time as to which theory or theories (for I have two) I advocate, but await a future opportunity to speak on this subject specially. I am at present making some experiments which I hope will throw additional light on the question. Dr. Curtis's paper follows:

"On October 12, 1886, I successfully implanted a superior second bicuspid in the jaw of Miss B., aged twenty-five years. The natural tooth had been lost seven years before this operation, and the tooth implanted was extracted two days previous to its use by me. On July 23, 1887, I extracted the implanted tooth. It had been in active service for nine months, without the slightest inconvenience to the patient, and without manifesting any unfavorable symptoms. The tooth was so firmly imbedded that it was necessary to break it off, and split the root and remove it in sections. An anæsthetic was used, as the operation was necessarily painful. The socket was then deepened, and a larger tooth implanted.

"On a recent examination, the tooth was found to be firm, the surrounding parts in normal condition, and the stranger restored to actual life and health. The patient has the same full use of this as of its predecessor.

"The extracted tooth, consisting of crown and upper two-thirds of root, was at once placed in Mueller's fluid (R Potass. bichromate, $2\frac{1}{2}$ parts; soda sulphate, 1 part; aquæ, 100 parts). After remaining in the solution a sufficient time, the tooth was decalcified, sections prepared, and a microscopical examination made.

"Fig. 22 shows section of middle third of root; A representing where lower third was broken off; B showing spot where cementum was destroyed before implantation, or, after implantation, during process of repair. The dentine is found to be in a normal condition, the fibres are not shrunk, and the whole presents the appearance of a like section of a freshly extracted tooth. Toward the lower part of root, between A and D, the cementum is greatly thickened, and has become converted into a dense fibrous connective tissue, partially calcified; between D and B this fibrous connective tissue has become converted into true bone, connected directly with the dentine-fibres.

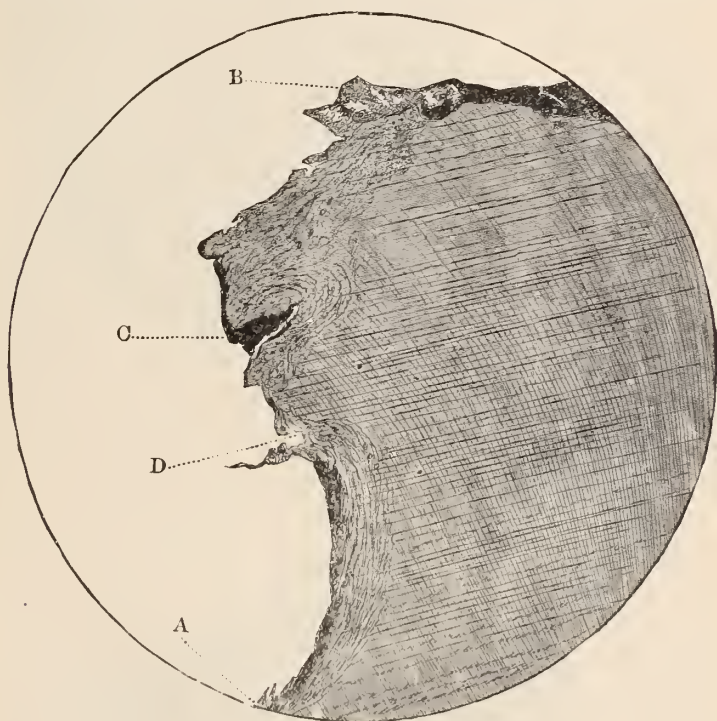


FIG. 22.—Magnified 100 diameters.

So intimate is this connection, that it is impossible to say where bone begins and the fibres of dentine end. This formation of bone contains bone-corpuscles and Haversian canals; one of the latter is shown at C.

"Fig. 23 is a section from a different level; B shows limit of root where broken off. Between A and B corresponds to like position in Fig. 22. In this section is seen no fibrous connective tissue as in Fig. 22, between A and D all is converted into bone. At C is shown a

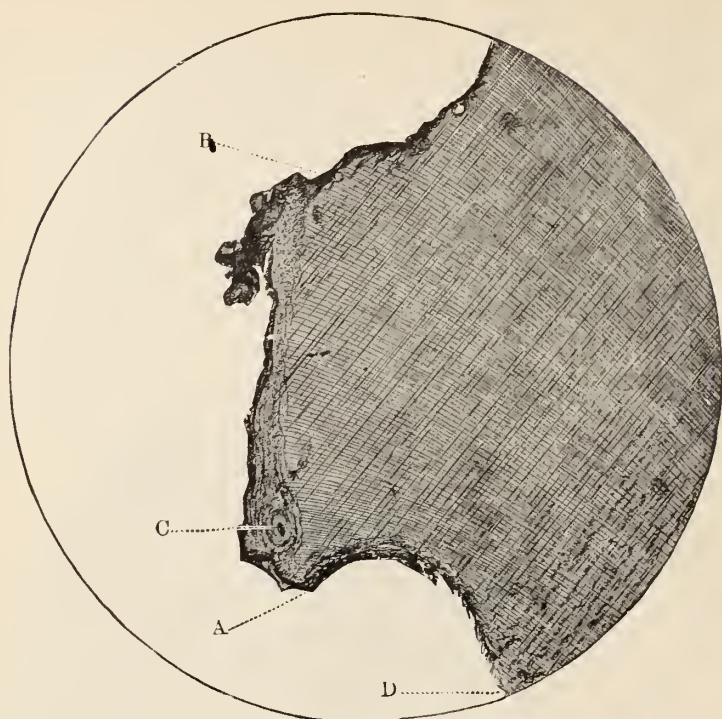


FIG. 23.—Magnified 100 diameters.

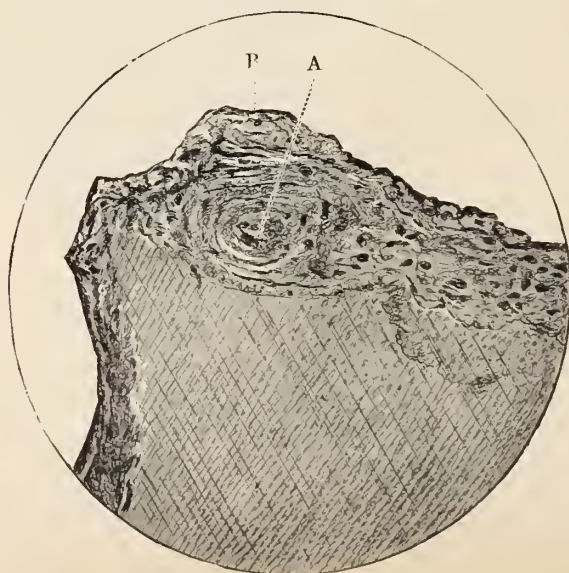


FIG. 24.—Magnified 250 diameters.

transverse section of an Haversian canal, with its concentric lamellæ. Between A and D corresponds to B in Fig. 22, showing spot destroyed before or after implantation.

"Fig. 24 shows same field as Fig. 22, more highly magnified; bringing into prominence the bone-corpuscles as seen at B, and showing the Haversian canal, with its concentric lamellæ A.

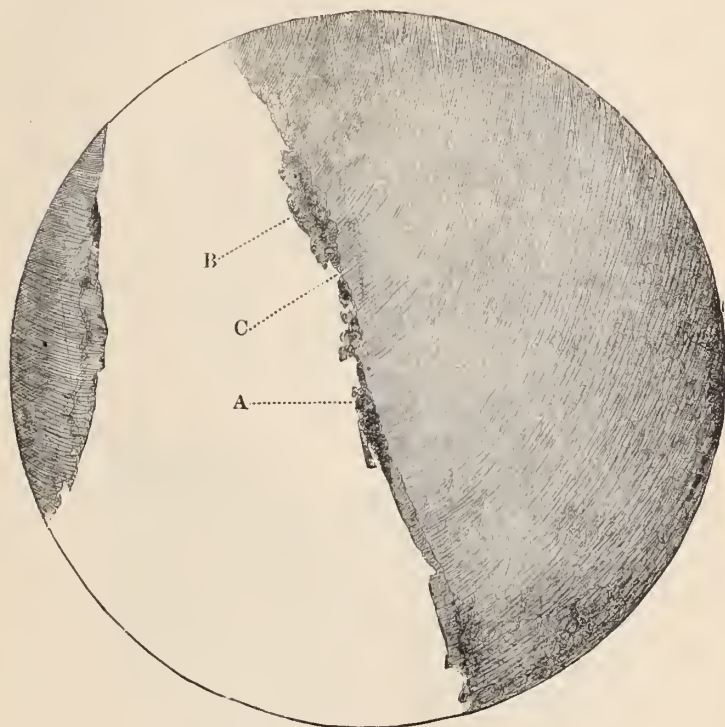


FIG. 25.—Magnified 100 diameters.

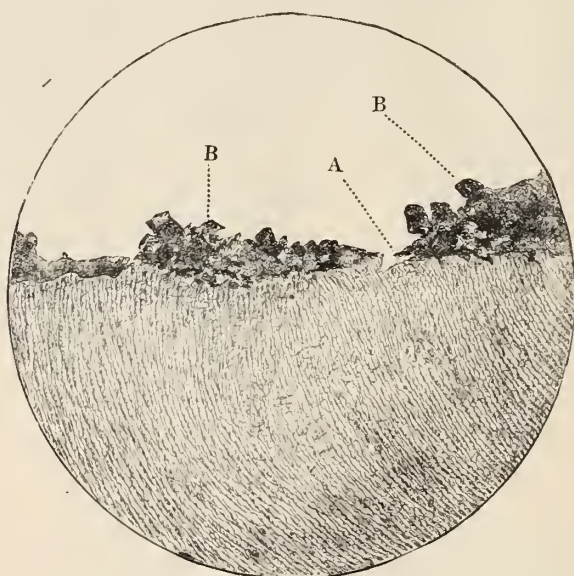
"Fig. 25 shows the pulp-cavity; between A and B is seen a mass of filling under which lie the revived odontoblasts.

"Fig. 26. Same field more highly magnified, A showing odontoblast; B B, masses of filling. The cementum of the upper portion of the root is normal both in the size and appearance of its cells. A small piece of alveolus, detached with tooth, presents no trace of a peridental membrane, but shows a highly vascular condition, and also a proliferation of connective-tissue cells.

"For the preparation of these specimens, the photo-micrographs, and for expert assistance in their examination, I am indebted to W. M. Gray, M.D., microscopist to the Army Medical Museum, Washington, D. C. It should be added that said specimens cannot cast any light

on the question whether the gum adheres to the implanted tooth, but from clinical experience I am inclined to the opinion that it does not. This point, however, will be conclusively demonstrated from the outcome of experiments which I am now making upon the lower animals. In these, sections of teeth in position will be submitted to microscopical examination.

"I may further say that, had the tooth subjected to experiment been unbroken, more points could have been proved. Had the tooth been whole, it could have been demonstrated whether the ossification extended the entire length of the root. In my opinion, it did. I believe that in this case the fixation of the tooth was caused by the reproduction of the bone-tissue of the alveolus. The inflammation consequent to the formation of a socket produced an infiltration of osteoblasts or bone-corpuscles into cement-substance. The outcome



Magnified 250 diameters.

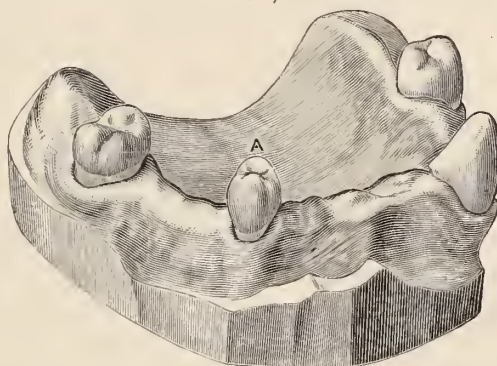
of this process is bony ankylosis. I also believe that the cementum, in fact the whole tooth, was resuscitated; otherwise, how could we get the normal conditions found to exist in the specimen examined; and especially, how could we explain the presence of the mass of cells near the pulp-cavity? These cells demonstrate conclusively that the tooth was active.

"In a paper read before the New York State Dental Society in May, 1887, I held as a reasonable theory, in view of the physiological changes in the repair of bone-tissue, that in a case of implantation,

where the tooth has been firmly held in place until fixation ensues, and where nature has been allowed to take her course, nothing short of true bone could exist, and that the union would be that of bony ankylosis. The examination, the results of which have been presented, demonstrates this theory by showing that an osseous union, or bony ankylosis, does exist.

“In the paper to which reference has just been made, I suggested the advantages of implanting teeth as supports for a bridge. May I be

FIG. 27.



permitted, in closing, to report a case in which I have carried into effect this advanced practice with eminent success? The patient, whose age is forty-nine years, had remaining in his upper jaw only three teeth—the left second molar, the right cuspid, and the second right bicuspid. To these I desired to attach a bridge, a full upper denture, but decided that the space between the molar and the cuspid was too great to obtain a safe and serviceable result. Accordingly, I implanted a freshly extracted tooth in place of the left cuspid, which was lost six years previous. The cast herewith presented (Fig. 27) shows the condition of the jaw six months after the implantation. The happy results attending like operations were obtained here, and the new tooth was firmer than any of its neighbors in the upper jaw. A bicuspid was selected for this operation, that occlusion with the inferior cuspid might be accomplished; thus it was held in position. A bridge consisting of thirteen crowns has been successfully attached to these four teeth, and to-day it is doing actual service, to the comfort and delight of the patient and to the operator's satisfaction. Other dentists who have watched this revolution express absolute satisfaction with it. As far as I know, this is the first case where a tooth has been implanted to support a bridge. In view of this fact, does it not seem practicable that plates can be done away with, whether few or any teeth remain in the jaw? And may we not advance a step farther, and implant full sets of natural teeth?"

CASES FROM PRACTICE.

In addition to the case which Dr. Curtis cites from his practice, I will insert three cases from my own, the first of which I believe to be the most heroic and remarkable as yet recorded.

Case No. 1.—Fig. 28 well illustrates the condition at the time the young lady presented. The lateral incisors were absent, and the cuspids were forward and very prominent. I extracted the cuspids, reamed the mesial walls of the sockets, and placed in position lateral incisors. When these had sufficiently healed, new sockets were made for the cuspids, the result at present appearing as in Fig. 29, the teeth being all firm and the parts healthy.

Case No. 2.—Fig. 30 shows the condition. The centrals were twisted and prominent, producing a deformity of an otherwise attractive face. Other dentists had ineffectually attempted the torsion and reduction of these teeth, and the pulps had died, in addition to which absorption of the roots was in progress. A bicuspid is noticed to be absent. I removed the centrals, and replaced them with a beautiful pair of "mates" which I had fortunately procured a short time previously from the gentleman who had extracted them. I corrected the irregularity, using every care not to enter the palatal canal, the result being a slight space. The young lady is now a much improved beauty, and grateful. The bicuspid was also implanted, and is the one I alluded to as having been done rapidly with my new instruments, this being my first case with them. The result is pictured at Fig. 31.

Case No. 3 —Figs. 32 and 33 show a case where a lower incisor was implanted. Dr. Younger implanted a tooth in this place, and it was lost after a year. It had never been splinted, and was done under very disadvantageous circumstances. In the operation here shown, after the tooth was placed, a groove was cut in the edges of three teeth, and they were permanently united by a gold filling, a gold wire passing through the centre for additional security and strength. This is in the mouth of a dentist, and is in a way experimental.

In conclusion, I will state that I have thus far performed the operation more than thirty times, and have not as yet lost one tooth. My friend, Dr. Curtis, has done more than forty cases, with but one loss, and I believe that Dr. Kirk has only lost four out of a similar number. Of these, two were exceedingly unfavorable cases, (syphilitic patient). Thus, even if we count them, we see here a report of more than one hundred cases, with a loss of but five, during the first two years' experience. Drs. Weld and Thomas, who have had unlimited experience in transplantations and replantations, prophesy that we have a great crop of failures yet to reap. It may be so, and yet Dr. Weld endorses an

FIG. 28.

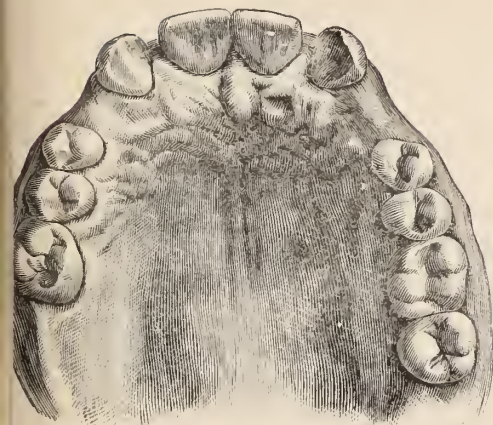


FIG. 29.



FIG. 30.

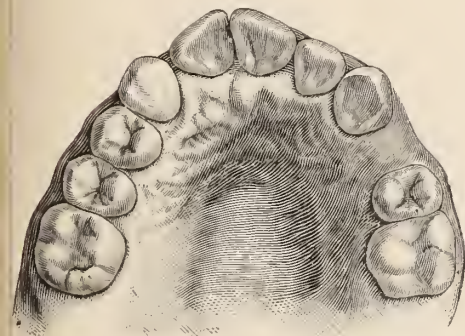


FIG. 31.



FIG. 32.

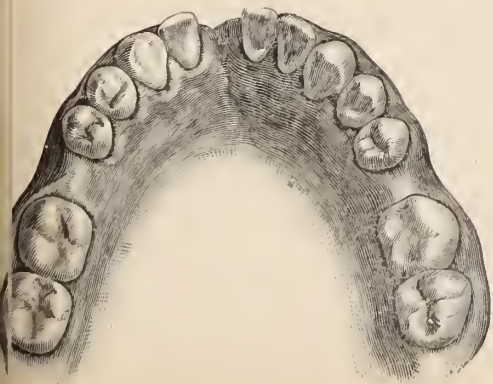
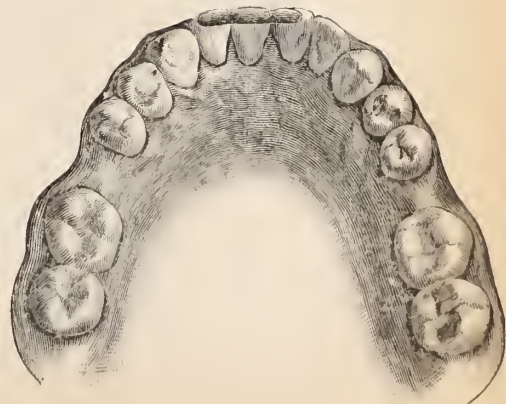


FIG. 33.



opinion expressed by Dr. Sudduth and incorporated into his article in *American System of Dentistry*, that, where a pulp has died, and later the pericementum is destroyed by disease which by treatment yields, the tooth being retained, the condition is analogous to the retention of a transplanted tooth. I consider this erroneous, as the tooth in that case is not "fixed" as are implanted teeth. To argue from that standpoint, however, these gentlemen must admit as much chance for the continued retention of an implanted tooth as for teeth of the character described.

The Cuts with the exception of the Anatomical Drawings were kindly loaned by "The Cosmos," (S. S. White Dental Manufacturing Co.)

35 W. 27TH STREET, N. Y.

SOME THOUGHTS ABOUT LABORATORIES.

BY H. NEWELL MARTIN, D.SC., M.A., M.D., F.R.S.,

Professor of Biology in the Johns Hopkins University.

Address delivered at the opening of the Hoagland Laboratory, Brooklyn,
December 15th, 1888.

From the point of view of investigators and teachers of the biological sciences, this may be designated the age of public laboratories.

There is indeed evidence that in Egypt, under the rule of the earlier and greater Ptolemies, there existed in Alexandria and were supported by the State, schools of instruction and research in the practical direct study of anatomy, physiology, and pathology; as well as great libraries in which every student could learn what had already been done or thought in his own department of study. But with the degeneracy of the later Ptolemies and the subjugation of Egypt by Rome, all that was good left Alexandrian science; the great museum became simply a place in which ceaseless metaphysical guesses and theories, barren of everything but bitter quarrels, took the place of the faithful and patient study of man and the rest of nature. Before the Christian era the Alexandrian school had almost ceased to be of any value to humanity.

From that time until sixty years ago there was not a single public laboratory for scientific study in the world; that is to say, a laboratory open to all competent workers on easy terms, and provided with books, instruments, and skilled assistants.

To-day such laboratories girdle the earth from Tomsk to Tokio—from Siberia westward to Japan. They are to be counted by the

hundred, and States vie in building them and making each new one more complete, and even architecturally more splendid than its rivals. One of the first things Germany did after the wars which welded her into a great empire was to build laboratories—palaces of science they have been called—in Berlin and Strasburg.

In this country the building and endowment of laboratories has for the most part been attained in a far better way—by private generosity, rather than by public subsidy, combined, as it must be with government control. Science cannot for any long period advance safely in chains, even if those chains be golden. There lurks as much danger to progress in an established national science as in an established national church.

This danger is illustrated by the comparative deadness of French science during the last forty or fifty years, in which it has been directed from a government office and centralized under bureaucratic control; and even in victorious Germany, now that the various States are consolidated into one empire, every detail of which is controlled from Berlin, many leaders of German science, especially among the younger men of talent and genius, are beginning to dread the outcome as regards the intellectual life, freedom, and vigor of the empire. Political questions influence the appointment of university professors, and such influence cannot but be injurious.

In these United States there is no such danger. The National Government needs the services of scientific experts in order to protect the health and promote the material prosperity of its citizens, to undertake great geological surveys, or the investigation of the life-habits of insects injurious to agriculture, or the study of the breeding places and habits of food fishes and of their enemies, or to promote artificial fish-culture; even from time to time to undertake, not merely for a prospective or immediate material gain, but for national credit and renown, great enterprizes on purely scientific grounds, such as expeditions to observe solar eclipses, or Arctic expeditions. For all such purposes it has, and has had, at its disposal the best qualified scientific men in the country, and it gets their services very cheap.

But, in addition to national scientific enterprises, as a supplement (perhaps in some sense as a corrective) to them, we need independent scientific research and facilities for it. And it may be interesting to consider how we, the American people, are solving the problem of the due promotion of scientific education and research by the government, while at the same time securing opportunities for independent thought and investigation.

The problem is being solved, *has* been solved, by the liberality of private citizens. While promoting the investigation of scientific ques-

tions by the ruling powers, they have also built and endowed laboratories, colleges, and universities. They have provided rooms and appliances for study and research, in which no earnest student can be repressed or suppressed because his ideas are new or in conflict with those adopted by the officials of a central government bureau. Through such private endowments—trusts as they are for the public welfare, numerous and generous—American science promises to attain a variety and independence of thought such as no national science has ever had in the past. Its characteristic is that it is individual—it is democratic. With a solid background of traditions and established ideas, it has a liberty which does not often degenerate into license; and all history teaches that such a combination is that which leads most quickly to human progress.

American science works not for the glory of a monarch, as Alexandrian science for the fame of Ptolemy Soter. Neither does it strive to promote the interests of an aristocracy, nor to fill the pockets of a plutocracy. Some such consequence may now and then follow its advance, but only as a by-result of its general contribution to the national welfare. It exists by the people and for the people. To make human life longer and healthier and happier is the result, as it is the aim, of modern science: to discover truths and to apply them to the welfare of mankind.

It is frequently asserted, and generally believed, that the first public laboratory for teaching and research was organized and set at work by the great chemist, Liebig; but this is an error. The merit belongs to Purkinje. Liebig's effort was no doubt far better supported financially, more ambitious, and more widely known; but some years before the foundation, in 1826, of Liebig's celebrated laboratory at Giessen, which is claimed as the parent of all modern laboratories, Purkinje had provided means for students to study physiology and pathology practically, to examine the working of the body in health and disease—the very subjects for whose investigation the Hoagland laboratory has been built, equipped, and endowed. To every physiologist present, the name of Purkinje will call up some remembrance of the man of genius who first paid attention to the retinal images of his own blood-vessels, images ever since known as Purkinje's figures; of the man who first described the peculiar sensations of vertigo produced by rotation of the body, and attempted to explain them; of the man who is the father of psycho-physics and physico-physiology; of the man who discovered the germinal vesicle of the ovum. Such achievements are glory enough; but to all the other fertile work of Purkinje we must in justice add the foundation of the first public laboratory (in the modern sense of the term)

after the Christian era. Liebig's deserved repute and fame need no factitious prop; and as to the question who founded the first public laboratory, we need, I trust, have no quarrel with our friends the chemists. The emulation is but an evidence of the belief of all students and fosterers of science in the value of public laboratories. That the merit of having first organized them is eagerly claimed, is a proof of their public utility. Our country believes in its laboratories, and its citizens provide them.

Purkinje's laboratory was but ill equipped; it was supported at first by his private purse, afterwards by voluntary contributions from his friends. No doubt its space was cramped, its apparatus scant, its general facilities for work very limited. Thanks to the liberality and patriotism of Dr. Hoagland, we are to-night celebrating the formal opening of a laboratory with abundant space, comfortable workrooms, an excellent library, the best apparatus that has been invented, skilled teachers and assistants, and with all else that may contribute to advance knowledge as to the workings of our bodies and the laws which govern them in health and disease. It is founded to increase human knowledge in regard to the *sciences* of physiology and pathology, and the *arts* of medicine, surgery, and hygiene.

On such an occasion it is meet that we gratefully recall Purkinje's work—the little germ from which this great laboratory has sprung and which gives us a direct and glorious ancestry, while also entitling us to feel some sort of parental pride in the great laboratories of physics and chemistry now to be found wherever civilization is firmly established.

The public-laboratory idea started by Purkinje and Liebig did not quickly spread. Bacon had long before pointed out the necessity of experiment in the study of Nature; but naturalists, for the most part, had still enough to do in the mere direct observation of the phenomena exhibited by plants and animals under the conditions of their normal daily life, and under circumstances of disease or accident. There were scattered here and there a few good experimenters; but the majority of biologists were usefully busy in simply seeing accurately under natural conditions; and very excellent observers many of them were.

It came at last to be realized that mere simple external observation of animals, though a fundamental first stage towards a knowledge of physiology and pathology, did not lead far; that it required to be supplemented by experiment. The majority of vital phenomena take place inside organisms, and therefore could only be observed by subjecting the animal to injuries, such, for example, as opening cavities of the body, in order to see the inner parts at work. The earlier experi-

ments were mainly the removal of such hindrances to direct observation. The thoracic cavity was opened to see the beat of the heart; or the abdominal, to observe the movements of the intestines. Soon the range of experiment was widened; it became obvious that in biology, as in other natural sciences, to know Nature and her ways we must cross-examine her by the Baconian method, putting her to work under conditions which could be varied at will by the observer, or, as he now became, the experimenter.

As an illustration, let me take such a common phenomenon as the movements produced by shortening of the muscles. Dissection of the dead body had taught that muscles were connected by means of nerves with the brain, and observation of cases of disease or accident had proved that a muscle immediately ceased to work when its nerve was seriously injured or was divided. Such direct observation led naturally to the conclusion that every muscle got its power or strength from the nerve, which thus came to be regarded as a sort of conduit carrying force or energy to the muscle from the brain. This erroneous notion was only upset by experiment added to observation. When it was found that the muscle of a living or recently killed animal, after section of its nerve, did still contract powerfully when excited by blows or by ammonia, by heat or by electricity, it became clear that the power or energy exerted by a working muscle resided in itself, and was not something carried to it by the nerve from the brain; that all which the nerve did was to set free or liberate energy already stored in the muscle, just as several other natural forces might do; the nerve like them, merely pulled the trigger and discharged explosive material already present in the muscle fibres. Thus our whole conception as to the physiological relations of the nervous and the muscular systems was corrected.

It is needless to multiply instances. At present nearly every organ and liquid of the animal body has been isolated from the rest and its properties studied under the most varied conditions. It is not too much to say that most of what is real and substantial in our knowledge of physiology and most of our similar knowledge in pathology is based on such experiments.

Researches of value need for their successful prosecution buildings adapted for them, numerous assistants, and (in addition to the outfit of laboratories of physics and of chemistry) many pieces of apparatus specially constructed for physiological and pathological purposes.

Another reason why laboratories are necessary is the improvement in methods of teaching during late years; we no longer believe that any natural science can be taught successfully by words alone even by the most learned and eloquent professor. When the con-

ditions are such that the students cannot make experiments themselves we insist that they shall at the least have shown to them the most important facts; that the lecture and the text-book shall have as their accompaniment, I might perhaps say as their basis, actual demonstrations, supplemented if possible by personal experimentation by the learner himself. We ridicule the notion of any real teaching of physiology to a student who has never seen a beating heart, a blood pressure experiment, a demonstration of the action of saliva on starch; of teaching pathology to those who have had no opportunity to observe the phenomena of inflammation with the aid of the microscope; of teaching bacteriology in its relations to disease to students who have never seen a bacillus, or had any ocular demonstration of its life history, or of the fundamental phenomena of fermentation and putrefaction.

Many of us can remember the time when all the practical instruction a medical student obtained was in the dissecting-room and the hospital wards. One outcome of that state of affairs was in the medical schools a very undue amount of time and energy spent in the study of minutiae of human anatomy; but the best teachers recognized that the men must have some practical training, and the dissecting-room was in those days the only means of providing it. Medicine and surgery are advancing, slowly but surely, and within the last twenty years with greatly increased velocity, from an empirical to a rational basis, both as regards the cure, and, what is infinitely more important, the prevention of disease. Now that physiology, pathology and hygiene are being yearly more firmly established on general scientific principles, and have so perfected their methods that fundamental facts in those sciences can be easily demonstrated to medical students (or even investigated by them), the dominant role which gross anatomy has often hitherto had in medical education will be lessened, and the student will get more and more of his practical training through experimental physiology and pathology and hygiene. To permit and encourage this most important advance in medical education such laboratories as the Hoagland must be provided and sustained by enlightened and public spirited men.

It is interesting to glance backward and see how slowly the idea evolved and put in action by Purkinje and Liebig took hold—at any rate as regards physiology and pathology. Fifteen years after Purkinje's effort, the practical teaching of physiology and pathology amounted to almost nothing. Partly, no doubt, because the essential independence of those realms of human thought and inquiry had not been recognized. These sciences were still regarded as mere accessories, more or less (perhaps on the whole less) helpful in the study

of medicine and surgery; they were generally considered as only worthy of attention because of their possible use in connection with the medical arts, and were for the most part taught in conjunction with other subjects by a single professor. The greatest physiologist of his time, and one of the greatest of all time, Johannes Mueller, was, in 1840, professor in Berlin of human anatomy, comparative anatomy, pathological anatomy, physiology, and embryology. That pathology is as distinct from pathological anatomy as physiology is from normal anatomy had not then been recognized, or another title would have been added to the list of Mueller's duties.

Among Mueller's students was Du Bois Reymond, now professor of physiology in Berlin. It is interesting to read his account of the small facilities for observation and practical work afforded in 1840 to students of scientific medicine under the greatest teacher of that time. He says:

"We were shown a few fresh specimens under the microscope, the art of putting up permanent preparations being still unknown. We had also opportunity to see the circulation of the blood in the frog's web" (something which every science student in every well conducted normal school in this country now sees without considering it any great matter). He goes on to say that he and his fellows saw the experiment of filtering frog's blood so as to retain the corpuscles and let the plasma through, and the resultant demonstration by the clotting of the colorless plasma, that the red corpuscles of the blood were not an essential element of the clot; he also had opportunity to observe an experiment in artificial digestion; one on section of the spinal nerve roots; a demonstration on reflex movements; and an experiment in pharmacology, proving that opium poisoning was not transmitted centripetally through the nerves. There was in the whole course but one demonstration on a warm blooded animal, namely, section of both vagi, to show the resulting disturbance of respiration. That the pneumogastric nerves had any influence on the heart beat was still unknown. These half a dozen demonstrations were all the quasi-practical teaching that the student of physiology or pharmacology received in the best schools in 1840. That he should put up microscopic preparations himself or make an experiment himself were things hardly dreamed of.

Moreover lecture diagrams were not in use. Du Bois Reymond states that he first saw them employed in England, and that he introduced them to Berlin in 1850.

It is, then, very clear that but fifty years ago appliances and methods for teaching histology, physiology, and pathology were very imperfect. We may next ask, how was it as regards facilities for re-

search? The answer is that there were none. "Did a young man desire to institute a physiological research, he had for the most part to work in his lodgings, where on account of his frogs and rabbits he got into trouble with the people who kept the boarding house, and where many experiments were quite impossible, or could only be carried out under the most adverse circumstances. No skilled assistants directed the young investigator's work ; no library was accessible to him ; no collection of apparatus gave him its precious aid. He had to buy his own books of reference and provide his own apparatus, often to make the latter himself." The student who undertook a research in those days rolled his induction coils, soldered his galvanic element, even made his rubber tubing, for that essential in every modern laboratory was not yet an article of commerce.

Some few men, those born to be physiologists, pathologists or pharmacologists, surmounted the difficulties. We need only call to mind the names of Du Bois Reymond, Ludwig, Brücke, Helmholtz, Vierordt, Donders, Bernard, and other of their contemporaries. There was a good side to all this difficulty. Only earnest students would surmount them, and undertake biological research. Whatever was done was done by a man who had his heart in his work, and who had to work so hard to do it, that when his research was completed it was almost certain to be of importance.

No one believes in laboratories more thoroughly than do I ; they are to-day among the institutions most essential for the increase of man's control over nature and his power to harness her as his servant, his drudge—instead of master. Nevertheless the great conveniences afforded by modern laboratories sometimes lead to their abuse. It has become so easy, in fact such a pleasant amusement, to make a so-called research, that a great deal of it comes from the hands of sciolists. It may seem hard to designate as trash a considerable percentage of the work now issued from biological laboratories, but there is no other way of honestly stating its value. Incompetent and imperfectly trained persons are almost daily publishing so-called researches, the reading of which is pure weariness of spirit ; and yet the physiologist or pathologist has to work his way painfully through them, in the hope that he may extract one grain from the bushel of straw. If I thought any considerable number of trivial or plagiarized "researches" would be the outcome of this laboratory, I could not honestly congratulate you on its foundation ; but supervised by its founder, and directed by thoroughly competent men, I have no such fear. No triflers will be allowed to continue their trifling in it ; and what it may publish will be the outcome of earnest and faithful and thoughtful work.

When I entered this room to-night and saw you all here, eager to inspect the Hoagland Laboratory, the query which presented itself to me was, What went ye out for to see? A reed shaken by the wind? Those clad in soft clothing? A prophetic or more than prophetic building? Is this laboratory to be but a mere transient and unimportant element in the intellectual life of your city? Is it to be but a place in which some teachers may live idly as those who dwell in king's palaces? Or is it to be the seat and the training place of prophets and more than prophets, from whom intellectual fire and enthusiasm shall spread over our nation?

These questions it is mainly for you, men and women of Brooklyn, to decide. The best equipped laboratory, the most devoted teachers, are almost impotent unless they have the active sympathy and support of the community in which they are placed.

I appeal to you, citizens of no mean city—one known the world over, as the City of Churches—and I speak with all sincerity when I urge you to cherish this laboratory as a new church. It is a temple for the study of the works of God, and to my mind as sacred a place as that in which you may meet to study the word of God.

Cherish it, foster it, keep its ideals high, so that as year follows year it shall become more and more a centre from which shall spread not only vast gains in our knowledge of the laws of health and in our power to conquer disease, but examples of single-hearted devotion to all that is true and noble and patriotic.

DESCENT AND DISEASE.

BY R. G. ECCLES, M. D.

Read before the Medical Society of the County of Kings, Nov. 20th, 1888.

The doctrine of evolution is now accepted in all branches of biological science as the best available working hypothesis we have. As a guide to discovery in new fields, its results are simply marvelous.¹ Whether intrinsically true or false, its magic formula is the "Open sesame!" to myriads of nature's secrets we have no reason for believing could have been found out without it. The implications of the theory and the facts of the universe agree through the most minute ramifications and in the most diverse directions. The editor of the *Medical Record*, quoting from the *Lancet*, lately said: "To withdraw the

¹ Proc. Amer. Asso. Adv. Science, vol. 36, p. 1, President's Address.

conception of evolution from the domain of science, would now seem to us quite as impossible as to return to the Ptolemaic system of astronomy."² Our text-books on physiology have begun to accept it as the best means at hand of explaining the properties of the highly differentiated tissues of a human being.³ The irritability of an amœba is the fundamental fact—the element so to speak—from which an explanation can be had of every property of the cells of our bodies. Slowly acquired and accumulated changes are supposed to have occurred that finally outwrought nerves, muscles, ligaments, and bones from amœboid little masses of protoplasm. At first indefinite in function, minute changes brought it into definiteness. Commencing incoherent in its parts as a monocular being, it is assumed to have finally cohered as a polycellular one. At the beginning without definite organs and in the end wonderfully and complexedly organized.⁴ No one need believe man to be an aggregate of differentiated amœba who does not desire to do so. We need not even try to string our facts together by the evolution hypothesis if any person can think out a better one. To assert creation by some other plan than that of evolution means nothing, unless the plan is told us so that we can compare it with the facts. If the universe, and all it contains, was framed by the word of God's power, what route did matter follow in obeying that word? So long as we are able to make new and useful discoveries by the aid of the theory of evolution, would it not be the height of folly to give way to the prejudices of people who have not themselves an idea on the subject that they dare to formulate. What if we do discover that we look as if evolved from brutes. It does not, therefore, necessarily follow that appearances are correct. If the Supreme Power saw fit to form all things into a harmonic whole looking like an evolutionary one down to the finest minutiae, what harm could there be in our discovering this fact? It does not necessarily follow that we are descendants of quadrupeds, amphibians and fishes, because the arrangement of things suggests that as the most probable explanation. We have not the making of the arrangement and so must take it as we find it. Who knows *how* the Almighty formed the universe? There is but one way to find it out, and that is by studying the universe! This study, so far as it has gone, reveals a connected total and tells of relations such as would be found if evolution had outwrought it. New discoveries may yet appear of a different order, and then we must find a different working hypothesis. Till then that man is foolish who refuses to use the only plausible, provisional explanation yet given. Let objectors either provide better or use it.

² Med. Rec., vol. 33, p. 305.

³ Foster's Physiology, by Reichert. Introduction.

⁴ "First Principles," by Herbert Spencer, p. 396.

To-night we propose to test this theory of Descent upon some disconnected facts of pathology and observe its power to unify them. Should we only be able to succeed in bringing partial harmony out of a mass of discord, the pleasurable excitement of the result will be ample compensation for our pains. Possibly the new standpoint from which we view them may prove a vantage ground in the warfare we wage against disease, and the hints we derive be of use to us in our future work. In every department, where tested, this course has been unexpectedly successful, and we know of no reason why it should not be equally so here.

A vague, uncritical sort of belief in the hereditary transmission of disease tendencies has obtained among general practitioners for a long time. Few have dared to allow themselves to speculate upon the possibility of this chain of tendencies stretching back into the world of animated nature below us. No one has a due conception of the vast magnitude of the possibilities involved in so daring a speculation. Is there any reason for believing that a large number of weaknesses and disease tendencies of the human family are part of this great system that makes us appear as if we had descended from quadrupeds? What harm can it do for us to work on this assumption for awhile and see whether or not it will prove as fruitful to the pathologist as it has been to the botanist, zoologist and physiologist? Is it not the height of folly in us to refuse to do so? Our speculation cannot alter the facts in the case. They will remain just the same when we are done as they were before we began. Should we in our eagerness to make the theory symmetrical distort the facts, the path of discovery will be closed to us. When a theory so distorted ceases its suggestiveness, as it certainly must, scientific workers no longer want it.

In considering the nature of the disease tendencies referred to, it requires no great prophet to see that we are on the verge of a mental revolution. If pathology follows in the wake of physiology in utilizing the doctrine of Descent, much contained in our present books on practice, gynæcology, and even surgery may become as antiquated as the chapters on phlogiston in old works on physics and chemistry.⁵ Etiology, which up to the present time has remained wrapped in darkness, may be expected to have a flood of light cast upon it. When leaders of medical thought say, that "Pathology affords scope for a far wider range of inquiry than has yet been bestowed upon it, and many of the problems which surround pathogenesis may find a solution in the observation of the lower animals, and in the facts of embryology,"⁶

⁵ History of the Inductive Sciences, vol. 2, p. 267.

⁶ Lancet, Feb. 27th, 1888, p. 406.

it is easy to determine the tendency of the times. If pathology is deranged physiology, why continue longer to refuse studying the former by the same lights as we do the latter? We should look for some of the most persistent causes of disease along the route of apparent or real development from unicellular amœba to the Caucasian race. Both as to our weakness and strength we should seek out the story heredity tells of the experiences of the lower animals as well as of our known human progenitors. Why we resist this disease and succumb to that depends mainly on our inherited forces. The study of these, how we came by them and what they are, should constitute a large part of the study of disease. To-day they are barely considered as to their existence and, among practitioners, not at all as to their genesis. The coming generation may wonder how we got along without knowledge as essential as it promises to be. A prominent American medical editor says: "Facts on all hands go to prove that in each individual there are certain constitutional peculiarities, congenital and not acquired, which govern not only the course and termination of disease, but likewise the susceptibility to its invasion."⁷ Bacteriological investigations have of late been pursued with less zeal than formerly, because they have failed to give medical science the full results promised at the outset by their ardent disciples. To distinguish between micro-organisms that are a cause and such as are but a consequence of disease is one of the interesting problems now confronting us.⁸ Even those that are demonstrably pathogenic seem to be powerless without the co-operation of bodily conditions. Inherited tendencies control to a much greater extent than has been heretofore supposed. Innumerable points of weakness are blended with those of strength, and the law of heredity preserves the former with as much pertinacity as the latter, leaving to the principle of the survival of the fittest the improvement of affairs by a slow process of elimination. Our bodies bear many scars and partly functionless rudiments that look as if they had been the successors of organs and glands that once disappeared through inactivity. These are sometimes the seat of disease and harboring nests for pathogenic germs.

Our upright attitude is itself the cause of more ills and the exposure to strain of more points of weakness than at first thought would seem possible.⁹ We read that "God made men upright and perfect, but they have sought out many inventions."¹⁰ Yes. And a goodly

⁷ Jour. Amer. Med. Assoc., vol. x., p. 722.

⁸ Vide Semmola's Address, Int. Med. Cong., in New York Med. Jour., vol. 46, p. 311.

⁹ American Naturalist, vol. 18, pp. 1-9.

¹⁰ Eccles., chap. 7, v. 29.

number of these inventions seem to have been for the purpose of overcoming the evils of the upright position. Look at the great array of surgical and gynæcological appliances for the diseases we are about to consider, then deny who can. Unfortunately for the ladies, they seem to be greater sufferers than the men. However their structure may have been devised, or who or what the architect, their one essential distinctive organ that gives each the name of womb-man is hung as if they were first designed to go on four feet instead of two. Every one of the peritoneal ligaments occupies the best possible position for the suspension of that organ in a quadruped and the prevention of its pitching forward upon the diaphragm while in a gravid condition. The best supporting ones of them all give but a very imperfect support in an upright being. The round ligaments, especially, show the marks of utter uselessness in the human female while of the very greatest use to the lower animals. Mr. Rainey's guess that their utility may come in during coition is puerile, for such a strain could only eventuate in the hastening on of the diseases to which the organ is liable.¹¹ A mechanism primarily designed to lead to disease or that became selected because it led to disease and death would be an anomaly indeed. All these ligaments are to an inquiring mind notes of interrogation. If we ask ourselves whether they could not occupy positions very much better for their owners, every unbiassed mind must, on the testimony of appearances, answer in the affirmative. When we try to conceive of a way whereby they could be improved for our wives, mothers, sisters and daughters, providing they always walked on "all-fours," we would be compelled to acknowledge ourselves beaten. Their directions are perfection itself for a quadruped, but extremely provoking if we want to believe them designed solely for the benefit of the human race. The inventive genius of man has long been at work, devising pessaries of every shape and form, to overcome what seems to be the faulty work of nature in putting ladies on two feet and weaving their uterine supports downwards instead of upwards, as we would have done had we had any say in the matter. What multitudes suffer in health and happiness from prolapsus, versions, flexions, and inflammations due mainly to our proudly erect attitude? How many infants' lives have been sacrificed to prolapsus of the funis, a thing unknown among quadrupeds? For reasons yet to be stated, it would harm them little if common. Where it is positively dangerous (*i. e.*, in the bimana) it is frequent. Where it would prove harmless (*i. e.*, in the quadrupeds) it never occurs. With woman it would not happen if she went on all-fours. When we undertake to restore the cord, we put her in

¹¹ Playfair's System of Midwifery, p. 62.

that position.¹² Our gynæcologists have also discovered that when they try to get the uterus into its true position before applying an artificial support, the best way is to put the woman on her hands and knees with head and shoulders downward. In other words, she must assume the attitude of a quadruped before the ligaments will properly do their duties and swing it where it rightly belongs. These things show us that in pathology as in botany and zoology everything looks as if evolution had occurred from lower to higher forms. It is evident that the theory of Descent is a good working one, and able to throw new light on old facts.

Turning next to the consideration of some serious troubles that men are heir to as well as women, we are again confronted with the baneful results of the upright position. The torturing agony of piles and its frequently accompanying curse, prolapsus ani, constitute a couple of the penalties paid for the pleasures of walking on two feet instead of four. In the hæmorrhoidal veins, valves would be useless to the lower animals, but in man their absence makes earth a living hell to multitudes. Many a human life has been lost by their absence, and many more must yet be sacrificed ere adjustment has become perfect to our manly attitude. But why are there no valves here? Why are the portal, iliac, venæ cavæ, and spinal veins, free from them? In these, above all others, they seem to be most needed. We find them just as they should be in the legs and arms. Here they are useful to support the upward rising columns of blood. We find two in each of the jugulars, but in the reverse direction to which they should be placed. Fortunately for us, they work badly. We find each inferior thyroid obstructed by one at the junctions with the innominate. We find the intercostal veins well supplied, although they are as devoid of use to upright beings as the celebrated fifth wheel is to a wagon. When we lie on our backs or sides, they are worse than useless, as they hinder the flow of blood toward the azygos. Surely, an arrangement of this kind could not have been devised for the bimana. Put us on "all fours," and everything is immediately seen to be as it should. The jugular valves that are reversed in us are all right in the lemurs, whose long dependent necks often need an upright support for their blood, as it flows from the head toward the heart. Ours need no support in that direction, as gravity alone is able to draw downwards, to the full capacity of the veins, as fast as disposed of by the heart. Regurgitation upwards does not occur. While on our hands and feet, the intercostal valves work like a charm, supporting the blood upwards from the front of our chests toward the back, whither it travels.

¹² Medical World, vol. 4, p. 409.

In this "all-fours" attitude we need no valves in the spinal, hæmorrhoidal, or portal veins, and our venæ cavæ can also perform their functions without them. When we are so placed, they occupy a horizontal position instead of a perpendicular one. For the two appended figures and most of the material of this part of my paper, I am indebted to Dr. S. V. Clevenger's article on the "Disadvantages of the Upright Position."¹³

FIG. 1—UPRIGHT.

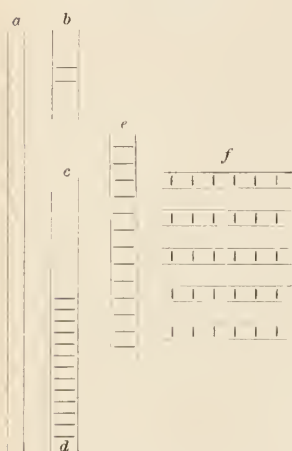
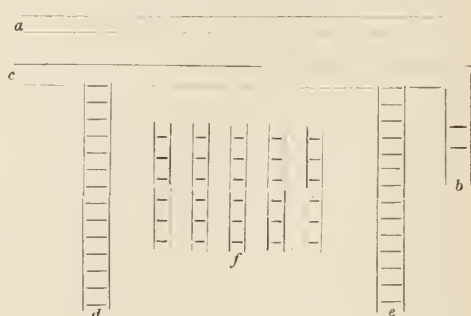


FIG. 2—"ALL FOURS."



a = Spinal.
b = Jugular.
c = Caval.

d = Femoral.
e = Brachial.
f = Intercostal.

Fig. 1 shows how the valves are arranged while in an upright position. Fig. 2 shows their arrangement when we are on our hands and feet, with head down. In this last position they are all right. In the former, most of them are wrong.

From quadrupeds, through monkeys, Negroes, Mongolians, and Indians, to Caucasians, there is a constant decrease in the size of the pelvic outlet, and a corresponding change in the shape of the pelvis. The antero-posterior or conjugate diameter averages less for women of the same size in the white race than any other. The pressure constantly exerted by the weight of the upper part of our bodies upon the bones of the pelvis has successively seemed to change the cuneiform outlet of the Negro into the square of the Mongolian, the round of the Indian, and finally the oval of the Caucasian. The weight and volume of the pelvic organs appear to have altered the box-shaped pelvis of quadrupeds into the wedge-shaped one of man. Every difference between the pelvis of a four-footed animal and that of a Caucasian is just what we should expect to occur under an incessant strain with conditions as they are. The intermediate steps exist in the colored

¹³ American Naturalist, vol. 18, pp. 1-9.

racés. The known laws of animal mechanics show just how it occurs. Our inheritance of uprightness seems destined more and more to narrow the pelves of our women in this same manner. This we might contemplate with complacency if our heads diminished in size correspondingly. Unfortunately the reverse is true. As time rolls on, the conditions of propagation seem destined more than ever to become embarrassed and the race to be less prolific. The lower races of men are free from such delivery troubles as fill our birth chambers with the long protracted, agonizing cries of maternity. Their heads are smaller and the outlet to their pelves larger. Uprightness and progression demand fearful penalties. Long protracted delivery, lacerated cervix, torn perinæum, prolapsed uterus, and a host of reflex neuroses, are the grim death skeletons that mock us] in our upward struggles. Dr. Clevenger philosophises thus upon the matter: "If we are to believe that for our original sin the pangs and labor at term were increased, and also believe in the disproportionate contraction of the pelvic space being an efficient cause of the same difficulties of parturition, the logical inference is inevitable that man's original sin consisted in his getting upon his hind legs."¹⁴ This kind of sin brought many other troubles on man besides the pains and accidents of childbirth. The little one after birth, even if subject to rachitis, is by its mother's anxiety hurried up in its efforts to become such a sinner, the result of which is an inheritance of crookedness. It is forced to go through life wobbling along bow-legged. Had it been kept longer as with four-footed creatures, the symmetry of its perpendiculars would not have been destroyed. Possibly, too, such undue haste has much to do with the large number of cases of inguinal and femoral hernia. It is estimated that twenty per cent. of the human family suffer from the first in its two forms of oblique and direct. By strangulation, many cases terminate fatally. It does not require a long inspection of the anatomy of these maladies to discover how little the tendency would be to their formation if, like beasts, we kept on "all fours." From the earliest infancy an effort is made to have the babies sit upright. Who can tell how very much of this hernia has its origin at this time? The weakness that predisposes thereto is an inheritance, but the upright attitude is the exciting cause. Animals have the former, but not the latter.

In the lower animals weak points are guarded or occupy places out of reach of harm. The philosophy of evolution explains this as a survival of only those so guarded. Animals exposing to danger a point of weakness were killed, and only those that came into existence with proper guards survived to perpetuate their kind. Man is a notable

¹⁴ American Naturalist, vol. 18, p. 7.

exception to this rule. With him every point of danger is exposed while on his feet, but guarded when on his hands and feet. Arteries, as a rule, are placed deep down in the tissues and below the veins. In this way they escape accidents and injuries that would often prove fatal. One artery, the femoral, does not obey this rule. It is near the surface. Occupying the inner aspect of the thigh, it is completely protected in quadrupeds. In man it is fully exposed, and but for our intelligent ability to care for ourselves, it would cause the death of multitudes. As it is, in wars, quarrels and accidents, many lives are sacrificed to it. The same is true of the abdomen and its viscera. Rupture of the bladder, peritonitis and death are not unfrequently the results of blows upon this exposed part. In quadrupeds presenting a front aspect to an enemy, this region is well shielded. Beasts in attacking one another aim at each others abdomens, and strive to present the shield to their own with which nature has endowed them. In man the exposure is as complete as possible, and millions on the battle-field have been swept away thereby. Our bony framework has undergone so much change in its articulations and adjustments that dangers from special dislocations due to the upright position are few. The clavicle seems to be an exception. Those common to it in us are not likely to occur in quadrupeds. Dislocations of the sternal end throw it forward, backward or upward, and of the acromial end upon the upper surface of the acromions or upon the anterior part of the spine of the scapula. These are all in the opposite direction to which blows or strains would be applied in a quadruped. Downward dislocations, the kind they would be liable to have, are next to impossible. Where they are safe we are exposed. The fact that the most common dislocation of the femur is upwards and backwards (*i. e.*, the ilio-sciatic) is significant.¹⁵ That is just what we might expect in assuming the upright position. As the hind legs of four-footed animals are not exposed to backward dislocations, but little special protection has been provided them in that direction. Lateral strains, however, are likely to occur. The protection sideways we would expect to be, as it is, good. In the upward position, downward dislocations are second in the order of frequency and lateral ones come last. All this shows that nature's guards are quadrupedal. The arms of man have undergone so many changes to suit them to his use, it could scarcely be expected that any simian or quadrupedal characteristics would be left behind. It is, however, a most remarkable fact that reduction of all humeral dislocations from muscular violence is now claimed to be best performed by putting the patient on his back and producing traction on the arm at right angles to the body.¹⁶

¹⁵ Erichsen's Surgery, vol. 2, p. 497.

¹⁶ N. Y. Med. Jour., vol. 44, p. 44.

When the intestinal tube of man forgets proper behavior and tries to turn itself outside in, is there not some meaning to the fact that it usually does so from above downwards? If we went four-footed we would not suffer and die of intussusception. This disease, so often the opprobrium of the surgical diagnostician in his failing to determine it early enough, is best relieved by turning the patient into a position the reverse of that we are so proud of being able to occupy.¹⁷ Inversion is declared by some English authorities to seldom, if ever, fail when taken in time.¹⁸

It has been observed by botanists that the growing buds upon a developing tree struggle with each other, in their own silent method, for the sap or food upon which their continuous existence depends. In this struggle apparently trifling events will determine which bud shall secure the best supply and live. The final symmetry of the tree is due solely to the outcome of this warfare. Pressure on the bark below may divert the current from the most promising bud to one much less so, and change the whole future shape of the tree. Lines of foetal strain and pressure, in a similar manner, may be misdirected, and a monster result where should have been a beautiful babe. Pressure may partly or wholly occlude an artery or some capillaries leading in a certain direction, and development consequently be totally arrested in that direction. The budding organ may have gone half, quarter, or three-fourths way through its intended changes toward perfection at the time. The force behind heredity being unequal to the task of removing the obstruction, a malformation results. Inflammatory action makes the occlusion complete and permanent. The new habit, vicious though it be, becomes fixed, and generation after generation gives rise to the same malformations, though the first cause is long gone. In ways like this came partitioned and bifid uterus, hare-lip, spina bifida, and a long list of the same kind. Our upright attitude and the upright attitude of pregnant women has for ages put a strain upon the capillaries of the region of the spine, that has tended to cut off the blood supply in the growing vertebræ. This has greatly increased the liability of human infants to have spina bifida. Among animals it is exceedingly rare along the back. Among human beings it is, alas! quite common. It is a daily saying that "there is no great loss without some small gain." Appearances indicate that to this disease, and the sacral curving from the weight of the upper part of the body, we owe our freedom from such a caudal appendage as is borne by most of our simian relatives. Such at least is the opinion of Prof. Lawson

¹⁷ Erichsen's Surgery, vol. 2, p. 661.

¹⁸ Lancet, Jan. 16th, 1886, p. 88.

Tait, after studying into the subject.¹⁹ He investigated the history of the tailless cats of the Isle of Man, and carefully examined a kitten that had lost its tail through a badly developed vertebra giving way. He found evidence enough in these to make it somewhat probable to his mind that, if man's progenitors ever had tails, they lost them in some such manner. Be that as it may, the curving of the posterior part of the vertebra in man, and its necessary rigidity at that point, would make such a thing a very uncomfortable attachment, especially in sitting. If our ancestors never had anything of the kind, this part of our anatomy looks very much as if they had. There are in the waters of the Mammoth Cave, fish that cannot see. Where other fish have eyes, they are without them. Dimpled scars exist just where the eyes should be found. They are most marked in the young ones, but quite plain in the old. Occasionally one is found in which they barely show. Atrophied organs of this kind are not uncommon among the lower animals. A very curious dimple exists in about fifty per cent. of the human race just where we would expect a scar from a lost tail. It is there in both sexes, but more marked in women, and especially well marked in babies. As the eye dimples in the eyeless fish seem to indicate that their progenitors had eyes, so the dimple that lies posterior to the anal orifice of so many of us looks as if tails had once been fashionable. In actual fact, however, we all have a rudimental one buried in the tissues. The os coccyx is as surely a tail, even if it is very short, as the longest one borne by a spider-monkey. At rare intervals, reversion occurs to ancestral types, and the Mammoth Cave fish come into existence with imperfect eyes. Occasionally a similar reversion seems to occur in men, and they are born in actual possession of an extension of the coccyx of several vertebræ, making quite a decent caudal appendage.²⁰ The young whalebone whales have teeth in foetal life, but, being useless to them, they are absorbed before birth. Their near zoological relatives have teeth. Occasionally one of these whales comes into actual life bearing these pearls in its mouth. Between the fourth and twentieth weeks of gestation, the human foetus has absorbed four extra joints below what becomes the coccyx. Somebody should have the kindness to read a meaning into these other than an evolutionary one. If the whalebone whale's teeth mean that their ancestors had teeth after birth, would it not seem that the absorbed extra vertebræ of human beings meant that their ancestors once bore these throughout life?²¹

¹⁹ *Nature*, vol. 18, p. 481.

²⁰ *Variation in Plants and Animals*, vol. 2, p. 76.

²¹ *Lancet*, June, 1885, p. 1178; *Variation of Plants and Animals*, vol. 2, p. 6.

Another rudimentary organ, which, like the terminal bones of the spinal column, is very much larger in foetal than actual life, is the appendix vermiformis. For the first four months it is continuous with the cæcum, as a cylindrical body like the small intestines. It is therefore originally one with the cæcum and a vestige of the alimentary canal. Like all rudimentary organs, its vitality being low, it constantly becomes smaller and smaller with age. In some it is only foetal, being absorbed before they are born. With others it is probably small at birth, as it has almost or quite disappeared at manhood. This proves it to have no necessary connection with the processes of life, and shows that such function as it may possess is scarcely worth considering.²² In herbivorous animals, as in the first weeks of foetal life, the cæcum and the appendix are one. In the rabbit a partial constriction separating the two is found.²³ Where no such division exists the cæcum, which with us is a mere rudimentary organ, is a large dilatation of the colon, connected with the intestines by small openings and forming the second stomach. It then almost fills the abdominal cavity, and has a capacity about twice as great as the stomach. If our ancestors once were closely related to the herbivora, they had a use for the cæcum and appendix. We have about as little use for them now as men have for mammæ or whalebone whales for teeth. That they secrete mucus or, in some instances, something else, proves no more than the fact that the masculine mammæ do frequently secrete milk.²⁴ Such secretion is but the remnant of a function once necessary, now possibly supplemental or vicarious, but nothing more. The most common position of the appendix to the cæcum renders it often a very dangerous affair. Grape seeds, pebbles, and small, hard, indigestible substances, find their way into the little worm-like tube, where they set up typhilitis. This leads to perforation through bacterial action, and ends in peritonitis and death. None of us know how soon we may be the victims of this agonizing disease, brought on by what appears to be a mere shriveled remnant of a once highly useful organ. Here is a death-trap that looks as if it had been devised by Satan for our destruction, and without conceivable earthly use as a compensation. If the story of evolution is not true, it surely looks like a diabolical contrivance.

Beneath the deep cervical fascia in monkeys and some other mammals a large air-sac extends from the hyoid bone to the sternum and thence sideways to the axilla. In foetal development a corresponding diverticulum occurs in man, that seems to mark our connection with them in a common line of descent.²⁵ Imperfect closure of this arrange-

²² Jour. Amer. Med. Assoc., vol. 11, pp. 4c-46.

²³ Nature, vol. 8 p. 540.

²⁴ Lancet, July, 1886, p. 75.

²⁵ Lancet, Feb. 27th, 1886, p. 387.

ment in the human family becomes a very serious affair, producing, as it does, fistulas, dermoid cysts, hydroceles, and atheromas, according to the contents and degree of closure.²⁶ It is all very well for the quadrumana to be blessed with these air-sacs, but why dangerous openings should occur in us along the very path and under exactly the same anatomical arrangements, is not easy to understand unless we accept the doctrine of evolution. There are a number of similar canals or passages like this which mark the places of parts functionally active in animals below us. Within these, congenital cystic tumors are of frequent occurrence. B. J. Bland Sutton, F.R.C.S., in a lecture at the Royal College of Surgeons, London, enumerates them as follows: "(1) The curious recess at the top of the pharynx, which brings the infundibulum of the third ventricle into relation with the buccal involution; (2) the neurenteric passage which brings the central canal of the cord and the alimentary canal into relation round the caudal end of the notochord; (3) the post-anal gut; (4) the bronchial arches; and (5) the developmental history of testis, ovary, and Wolffian duct."²⁷ Another one is found in the foetal tongue, running from the foramen cæcum to the origin of the middle portion of the thyroid gland. It is a favorite place for dermoid cysts. Then there is the œsophageal cæcum of veterinarians. This is a blind pouch found in elephants, camels, hogs, etc. Dr. Albrecht, of Brussels, has traced it out as a remnant of the air-bladder of fishes. Its mark appears in the human embryo, and, although closed at birth, remains as a weak spot for the development of pharyngocele.²⁸

We now come to one of the most curious implications of comparative anatomy and embryology. The development of the thyroid gland from the gills of fish at first sight looks very improbable, and yet the facts seem to point that way.²⁹ It is found in all animals down to the amphibians, where it disappears, gills taking its place. The structure is something like that of a gill. The blood supply is arranged in the way best adapted for aeration. The rudimental function still retained by it is just what might be expected from an atrophied and buried gill. In all cases of impeded respiration during running, carrying heavy loads, sleep, menstruation, pregnancy, etc., it supplements the work of the lungs. At such times it becomes highly congested and can in some persons be seen to stand out and pulsate like a great artery. Its blood supply is simply immense for so insignificant an organ, being more than all used for the brain. Its arterial branches break up into

²⁶ N. Y. Med. Jour., vol. 42, p. 18.

²⁷ Lancet, Feb. 27th, 1886, p. 387; Wagner's Pathology, p. 507.

²⁸ N. Y. Med. Jour., vol. 42, p. 17.

²⁹ American Naturalist, vol. 18, p. 3.

myriads of minute stems, which, entering its glandular structure, surround the lung-like alveoli.³⁰ It is evident that its function is not pressingly necessary in human beings, as some persons are born practically without it, a thin membrane occupying its site.³¹ Its removal in most cases produces no known ill effects, but in a large number myxœdema results.³² The production of this trouble from extirpation of the gland may be as purely reflex as that form of parotiditis, which is a common occurrence after various unlike operations upon and accidents to the pelvis and pelvic viscera.³³ Since some can live without a thyroid gland, why cannot all? If we all could enjoy life without it, why was it given to us? If it remains as a vestige of the breathing apparatus of our very remote ancestors, we can see at once its necessity. All such organs are needed to carry foetal development past the stage which represents their period of utility in actual life. Heredity is repetition, and an animal that develops by the law of heredity must repeat the steps which produced it partially or wholly. The blood must flow through all the old channels before it can reach the place where it can begin to develop the new ones. If the thyroid gland is not an evolutionary product, its disease producing proclivities defy all teleological speculations on beneficence in the universe. That the human form divine should have been knowingly and wilfully constructed on a plan that would cause it to become horribly distorted in thousands because they happened to live in deep valleys or drink water impregnated with certain minerals, seems too monstrous to believe. To see a poor peasant woman in a Swiss canton with the largest volume of her neck hanging over her shoulder and supported in a bag, because she was born with an organ that is of questionable use to her, and that many of her fellows have lived and enjoyed life without, is not calculated to increase the reverence of an intelligent man who believes in special creations rather than universal biological laws. When we go farther and discover that the progeny of this poor goitrous woman is very likely to be composed of cretins, the matter becomes much more serious. It is bad enough to have her own neck deformed, but it is far worse to have her children grow up as drivelling idiots, with narrow flat heads, shrivelled, small brains, and not sense enough to keep their lolling tongues in their mouths or to wipe the flowing saliva from their slobbered faces. A few years ago statistics recorded fifty thousand living cretins in Europe, more than half of whom were

³⁰ Todd's *Cyclopedia of Anatomy and Physiology*, vol. 4, p. 1102.

³¹ *Reference Handbooks of the Medical Sciences*, vol. 3, p. 352.

³² *Medical News*, vol. 50, p. 74.

³³ *Medical Times and Gazette*, vol. 2, p. 290.

³⁴ *Lancet*, Feb. 20th, 1886, p. 375, and Jan. 9th, 1886, p. 86.

traced to positively goitrous parents.³⁵ The diseased condition of this gland in the mother interferes with the course of development in the embryo. How it does so is not known, but the checked cerebral growth would almost seem to indicate that the mother's goitre sympathetically affected the foetal thyroid at a time when it performed a necessary part in the development of the higher nerve centres or at about the time the organism would be passing the amphibian stage.

The question of the etiology of neoplasms has been a fruitful source of ingenious speculation for many years. Of late it has received extra stimulation owing to the deaths of two such well-known men as General U. S. Grant and the late Emperor Frederick of Germany from cancer. It will probably be long before a consensus of opinion obtains in a matter so involved and obscure, but the tendency of accumulating facts seem to point toward the doctrine of descent for the best solution to the mystery. We have already discovered the source of many cystic tumors in sealed up obsolete canals, where a small unoccluded, cavernous spot, by reverting to its ancient habit of secreting, was at the bottom of the trouble. Allow me now to quote a passage from Wagner upon epithelial cancer that will at once shed more light upon another class. He says: "It may happen that epithelial germs of the horny layer, as well as of intestinal glandular layer, reach by a pathological process into the deep structures, in which they lose every connection of the epithelial matrix by constriction; here, like the enamel germ destined for the permanent tooth, they may remain latent for years, without losing their capacity for development."³⁶ What in lower forms of life would have developed into perfect glands of many kinds may in the higher foetus be rolled into and made fast in the deeper structures. Their latent potency may be stirred up sympathetically, vicariously or by irritation, and cause them to try among distorting difficulties to restore their lost forms and functions, thus giving us burrowing cancers. In other words, they are attempts at reversion to primitive types under conditions unfavorable to such reversion. The favorite seats of such growth will be near points of union of unlike tissues. It is a well known fact that the reparative or proliferating force of the cells of animals varies inversely as their specialization.³⁷ Cut a polyp, and each piece will grow a new body. Cut a lobster's leg off and it will grow out a new leg. Cut a man's finger and he has only power to restore comparatively a mere speck with scar tissue. The older a man is the less his reparative power? Does this power of

³⁵ Reference Handbooks of the Med. Sciences, vol. 3, p. 350; Quain's Dict., p. 538.

³⁶ Wagner's Pathology, p. 486.

³⁷ Phila. Med. Register, vol. 2, p. 542.

the fœtus compare in its successive stages of development with that of the animal's whose specialization they represent at these stages? No one knows. We can infer from the fact that the power increases inversely as age, that it probably does. Even in old age an irritated injury will give out exuberant granulations on normal tissuë. The connective tissue of a jelly fish has an indefinite power of proliferation. If a few of the connective tissue cells of a two weeks' fœtus should be arrested in their development while the rest of the body went on to ordinary perfection would they, like enamel germs, hold for years the latent power of their excessive proliferation? We do not yet know how far back arrests of this kind occur, but we do know that they are common during various stages. Virchow has demonstrated such unconverted elements in a number of tissues. In the evolution of bone from cartilage we can see the process plainly. Numerous little isles of cartilage cells can often be found in adult bones that have never gone on to the production of true bone. Cohnheim declares these to be the foundation of most neoplasms, and Mr. Sutton, in the Erasmus Wilson lectures on Evolution before the Royal College of Surgeons, says of such tumors that "they are always confined to regions of the body where the elements of which they are composed are to be unequivocally demonstrated."³⁸ Reversion to the ancestral function of such arrested cells becomes our most plausible theory of the production of the majority of cancerous growths. In the lower animals the ordinary repair tissue often goes on to a most abnormal extent. Should we then wonder that cells of the same type, carried up from the fœtus to the man, should act in a somewhat similar manner?

It is now about time for pathology to seek to put itself upon a scientific basis by attempts at broad generalization. Year after year the papers of our societies and medical journals are crowded with reports of cases, curious and common, but rarely does any one try to bring them together and seek to get a meaning out of them. Why should we continue carrying grists to mills that cannot or will not grind, or building-material for houses no one endeavors to build? Case on case is piled mountain high in inextricable and abominable confusion, and no one is any wiser as to what it all means. What if we are caught slipping sometimes in our theories? They stir up thought and instigate to investigation. Show me a man that thinks he never theorizes, and I will show you one who never added an iota to the sum total of valuable human knowledge, and who never will till he rids himself of his foolish conceit. Prof. Pye Smith in his presidential address before the

³⁸ *Lancet*, Feb. 27th, 1886, p. 386.

biological section of the British Association for the Advancement of Science a few years ago, said: "The progress of therapeutics is to be marked, not by the labors of 'practical men' (who, by the way, are of all the most theoretical, only that their theories are wrong), but by the, at first sight, unconnected studies of Des Cartes and Newton, of Hooke and Grew, of Lavoisier, Davy and Volta, of Marshall Hall and Johannes Muller."³⁹ There is not a doubt of this. Chemical, botanical, electrical and physical theories that physicians as such had nothing to do with, have led to all our substantial progress in therapeutics. May we not now hope that the speculations of Lamarck and Darwin, Spencer and Wallace, Huxley and Morse, Mivart and Haeckel, with those of Cope, Lankaster, Dollinger and Klein, may yet do as much for pathology?

DISCUSSION.

DR. PILCHER.—It seems to me that such a paper as that which we have had the pleasure of listening to this evening, one that evidently is the result of much thought, and that is likely to stimulate thought to such an extent, should not be permitted to pass without some discussion, without some attention being shown to it by this Society, even if that should be nothing more than the expression of a feeling of dissent. I had hoped that some of my older brethren, of whom I see so many—some of whom we know to be able to cope with such a question—might have been willing to have given us the benefit of their own thought and of their own information.

However, I would not be willing, personally, that a subject such as this should be permitted to pass with no expression of opinion as to its merits. I do not feel called upon in any way to discuss the general subject of the doctrine of evolution; but it does seem to me, if this doctrine be true, then some of the views of human life and human experience and human anatomy that have been given here to-night might possibly be called in question, although they have been presented in so striking and interesting a manner. Some of the views that have been presented to us this evening seem to me to be in direct antagonism with the truth of the theory from which they have been evolved and upon which they are based. If the law of the survival of the fittest, the great law of Mr. Darwin, be the law which has determined the evolution of one phase of life after another, then the fearful evils which are described as attending the man going upright should have caused him long ago to have perished from the face of the earth, as certainly, if we are to believe the statements of the speaker to-night, they are likely soon to do. It has been very clearly proven to us, if we accept

³⁹ *Nature*, vol. 20, p. 409.

the premises of the speaker, that the human race must very soon become extinct, or that it must adopt the quadrupedal condition. If this is true, how is it then, from the doctrine of evolution and the survival of the fittest, that the first one who was venturesome enough to rise from the four-footed state to walk with his head erect, could have escaped the condemnation which is now hastening to come upon us all.

I remember my attention being called, when I was quite a lad, to the Bridgewater treatises, and the wonderful manner in which Paley and Sir Charles Bell and others, who were authors of these treatises, undertook to prove the omnipotent and omniscient plan of the universe, from created things, and especially from the manner in which man had been formed and fitted for his particular work here upon earth; and yet it would seem that they are all wrong, that even diabolical machines or traps have been set in the arrangement with which we have been endowed; which are explicable upon the doctrine of evolution, but are to be condemned as infernal, if the teaching of the Bridgewater treatises be the true one. It may be so. At the same time, it has seemed to me that this thought might be suggested—that it would be the worst thing which could happen to us if we were to live forever, and that one of the greatest blessings that comes to us is that there are these little weaknesses in our frames that may shorten our existence, and enable us to be translated to another sphere; if that is the case, they may not be such a terrible thing after all. There may be some explanation, from that point of view, for these little loopholes, which a critic may find here and there in our anatomical arrangements, whereby it is possible for the machinery to get out of order and for us to be broken to pieces.

I have enjoyed, extremely, listening to the earnest and fruitful¹ remarks of the speaker, and I believe we will all feel under obligations to him for having quickened our thought. We have been in the habit here of listening to dry and sometimes not particularly profitable accounts of individual cases, and it is a refreshing thing to have an attempt made to bring us up to a broader and a higher point of view.

Dr. BUNKER.—If I were one of the gentlemen disposed to deny the Doctor's premises, and to feel shocked at his conclusion, I should still wish to declare myself profoundly impressed by the essay which he has given us to-night. It seems to me emphatically the right kind of work. I feel that we are honored that such work is brought before us. My own preference is to listen to the other side; I feel myself very much on Dr. Eccles' side. I think his premises are pretty nearly incontrovertible, and his conclusions are certainly very interesting indeed.

As the Doctor will probably sum up, later in the evening, it occurs to me to suggest to him, *apropos* of his discussion of the relations of the

thyroid gland and cretinism, the recent studies of various anatomists and pathologists with reference to the relation of the thyroid gland to tetany. In view of the fact that both cretinism and tetany point to chronic disease of the central nervous system, while in both there is found a striking coexistence of structural changes in the thyroid, I trust the Doctor will find my suggestion germane, and will give the matter his attention in closing the discussion.

Dr. HOPKINS.—Mr. President, I came here especially to listen to the paper which will occupy the latter part of the evening; but I may say that I have been exceedingly interested in this paper; it shows the result of much study, and it certainly ought to excite a great deal of interest. But, as I have followed the Doctor in the course of his paper, I do not feel prepared to discuss it fully. He has adopted, in my estimation, a great many false premises; he has reasoned from a great many false positions.

The gentlemen who reason upon this plan ask you to accept certain things which they cannot prove. When they get that acceptance, then they can prove everything; that is the trouble with a specious argument of this kind. I am not prepared to take it up, but I do positively enter my protest against the acceptance of such views, and I think they admit of entire refutation.

Dr. FOWLER.—Like the last speaker, I have not given this subject much attention; but it seems to me we might go on for the entire evening, and for the time allotted to these meetings for many evenings, in the discussion of the problem of evolution, and be no nearer to a rational conclusion at the end of that time than at the present. I think the subject is entirely too vast to cope with in an ordinary meeting of a society of this kind, and unless some special time is set apart, I imagine it cannot be at all profitable.

Dr. HARCOURT.—I may say I have listened to the paper with a great deal of pleasure and profit, and I consider it a very interesting one. It strikes me that the subject has not been sufficiently emphasized, and it has not received that strong endorsement from writers that its importance deserves. I am surprised to hear some of the gentlemen here say that the Doctor draws wrong conclusions.

I can endorse every proposition he mentions; I believe in it. He has mentioned facts, and anatomical facts, and until these are disproved, it is time enough for gentlemen to say he has drawn wrong conclusions.

In regard to the relation of descent to disease, I don't see how any rational person can doubt such a theory.

Let us take up one of the ordinary things that we meet with daily; take the case of consumption: An eminent physician in England has

found, out of 1,000 cases, 12 per cent. inheriting a predisposition towards the disease, and 48 per cent. manifesting what he calls family predisposition. He defines *hereditary* predisposition as that where the parents are afflicted with the disease of the patient, and *family* predisposition, that where some of the remote ancestors were afflicted with the same disease. In fact the laity, who know nothing about disease except its inconvenience, are very well satisfied that consumption runs through a family.

Take the case of cancer. When a patient comes to consult you concerning a hard painful tumor of slow growth, adherent, or perhaps a soft ulcerating tumor, the diagnosis of cancer will at once suggest itself to you, and you are pretty sure to make inquiries whether any of the patient's ancestors or parents had such a disease. If so, we are pretty certain of arriving at a positive diagnosis, with the assistance of the microscope.

Take the case of syphilis: I do not suppose there is anybody here who has not had cases of children who manifested the disease, on account of the parents being afflicted with it. I recollect seeing it in a child seven years old. The father had been a dissipated man, the mother had contracted it from him, and it showed itself afterwards in the child. I don't see how it could be otherwise, considering the way the blood must be contaminated with the poison; and it is almost impossible for the woman to have children without their being afflicted the same way.

I think the paper is a valuable one, and one that will cause us to think; and I feel safe in endorsing every one of his premises and conclusions.

Dr. ECCLES.—It is unfortunate that the debate has taken the present trend of defending or opposing evolution as a doctrine. The paper of the evening purposely steers clear of this, and merely undertakes to show that as a working hypothesis, *whether true or false*, it is the best at our command. In fact no other is offered as a substitute, our choice being evolution or nothing. It points out the fact that in chemistry, botany, zoology, and even astronomy, its power as a guide to discovery has been simply marvellous, and the question is asked: "Can it not be utilized in the domain of pathology with equal effectiveness?"

Dr. PILCHER's position, if designed as a blow at Darwinism, is not well taken. Were I here to defend that doctrine as true it would be easy for me to point out in reply that the objection he raises resolves itself into a question of weights or measures. Having a pair of scales with a large weight on one side and many small ones on the other, the aggregate gravific power of all the small ones must exceed that of the

large one before the beam turns. Dr. Pilcher, to sustain his position in a proper manner, should be able to show that the disadvantages of the upright position weigh more in the struggle for existence than the advantages. The paper of the evening did not have to deal with the latter phase. Whether extinction occur at all, or with what speed it would occur, depends entirely on the ratios of weights in the two scale pans. Evidently the Doctor has lost sight of the double-sidedness of the problem. Pathology only deals with disadvantages, but philosophy should draw a balance between advantages and disadvantages.

Paley's *Bridgewater Treatise* was all right as far as it went. Nature's adaptations are wonderful indeed, and much more so than any one dreamt of when it was written. The facts referred to to-night were unknown to Paley, so that if he had wanted to show failures of adaptation instead of fitness, he could not have presented these.

I thank Dr. Bunker for his reference to the connection of tetany with enlargement of the thyroid gland, the fact being new to me.

Dr. Hopkins gives us to understand that my premises are all wrong and my conclusions thereby vitiated. Since false premises can only lead to false conclusions, he refuses to grant the former and thereby avoids entanglement in the latter. He failed to show which premises he meant or what conclusions he referred to. With considerable warmth he protested against such heresies, and declared his belief in the possibility of their entire refutation. The Doctor evidently misunderstood me. He thought I was defending evolution. Whether true or false, this hypothesis has worked wonders so vast that really it is bewildering to the intellect to attempt to grasp them as a total. Myriads upon myriads of discoveries have been made by its aid in all departments of science. Why not use it in pathology and see if it can not be made as useful there as in other places? Take it as you would a machine to do your work. Never mind whether you believe or disbelieve it. Is Dr. Hopkins willing to use it as a mere labor-saving device and means of discovery, or will he reject it as so many human fossils rejected steam looms and spinning machines, because they believed them to be inventions of the devil? Like a railroad train, it can carry us beyond the frontiers of present human knowledge with great swiftness. Will Dr. Hopkins get on board with me, or will he refuse to do so for fear of patronizing a device of Satan?

RECOLLECTIONS OF SOME CASES OF THORACIC ANEURISM.

BY JOHN Y. TAYLOR,

Medical Director, U. S. N., in charge of Naval Hospital.

Read Before the Brooklyn Pathological Society, Dec. 13, 1888.

The diagnosis of aneurism of the thoracic aorta, while occasionally plain enough, is sometimes, it must be conceded, very obscure and difficult, and thus it happens that the earlier symptoms of the affection are often not recognized as such, as the records of any hospital will show, where cases of aortic aneurism are not unfrequently admitted as with chronic bronchitis, incipient phthisis, asthma, rheumatism, pleurodynia, etc. The location and size of a true or false aneurismal tumor, the direction in which it expands, its tardy or rapid increase, the adhesions which it forms, the parts subjected to pressure and the amount or degree of pressure, the condition of the heart and state of the circulation, may so act, singly or conjointly as to cause a great diversity of symptoms, so that in hundreds of cases there will probably not be two in which the manifestations will be precisely alike in all respects. Sometimes, after certain symptoms pointing to aneurism have been observed, the extraordinary circumstance occurs, of the disappearance, by reason of the tumor taking a new direction, of all such physical signs, with or without the substitution of others, and in fact, examples are not rare in which no symptoms whatever were developed during the course of the disease.

More than thirty years ago, and the assertion still applies, notwithstanding the more modern aids to diagnosis, Professor William Stokes said, "It may appear strange that a disease of such importance should ever exist without being accompanied by signs, which, if not sufficient to determine the nature of the affection, would, at all events, indicate some important organic disease. Yet, cases do certainly occur in which, at some period at least, the disease may elude the most careful investigation, and proof is not wanting of the continuance of this latency even after a copious hæmorrhage has taken place from the sac itself."

The following brief and necessarily incomplete sketches may serve in a small measure as illustrations :

I. Naval Officer, æt. 45, a bachelor and free liver, but not intemperate ; history of ill health for an undefined period. His complaint assumed the form of chronic bronchitis and asthma, for which he had been under treatment by his family physician and others for two or

three years. It was his whim to preserve copies of all prescriptions given him, and of these he had a large collection ; they appeared to be directed chiefly against the conditions above mentioned. Not long after coming under observation at the hospital, his symptoms began to put on a very serious aspect. There was a "clanging" cough, with moderate expectoration, and intense dyspnœa, the latter distinctly paroxysmal; the respiration in the interval being without discomfort. These paroxysms of dyspnœa became more and more severe. The expiratory act was free, but the inspiratory efforts during the paroxysm were extremely distressing and ineffectual, the glottis closing like a valve at each inspiration. The laryngeal muscles were partially paralyzed by interference with the functions of the recurrent laryngeal nerves, thus relaxing the posterior crico-arytenoid muscles, and this peculiar condition brought the question of tracheotomy as a palliative, under consideration in consultation. The paroxysms were usually relieved for the time by inhalations of chloroform. A pulsating tumor, of the nature of which there could be no doubt, soon appeared at the supra-sternal fossa, and behind the right sterno-clavicular articulation, and the patient met with sudden death during the momentary absence of his attendant. No autopsy was permitted. The notes of this interesting and tragical case are not at present obtainable, but it made a lasting impression upon all witnesses, including several distinguished civil practitioners.

II. J. S., æt. 37, a sea-going man, the greater part of his adult life having been passed in the whaling service. Of a dissipated habit; history of syphilis, rheumatism and chronic alcoholism. He had advanced cardiac disease of long standing (great hypertrophy and valvular insufficiency), with the usual accompaniments. A notable symptom was developed in this case towards its close—a typical example of amnesic aphasia, (sensory aphasia of Charcot). The aphasia was not complete, but was rapidly progressive, so that his vocabulary speedily became reduced to short substantives—verbs were difficult. He had adopted as a substitute for everything he could not remember, a most objectionable word not to be mentioned to "ears polite," and as he often visited his acquaintances when well enough to go out, many embarrassments ensued. He was told that it would be absolutely necessary to abandon this obnoxious monosyllable, which he presently did, employing "hoo-hoo," an invention of his own, in its stead. Thereafter, every forgotten word or phrase was "hoo-hoo." On the last day of his life he said "hoo-hoo to-night."

Post-mortem examination: Heart enormously hypertrophied—a true "bullock-heart," mitral incompetency. In place of the aortic valve stiff masses of cauliflower-shaped fibrinous excrescences had col-

lected, quite devoid of any valvular effect, causing considerable stenosis at the aortic orifice. A large unruptured aneurismal tumor, the existence of which was unknown during life, occupied the ascending aorta; atheromatous degeneration of the intima of the vessel, and numerous calcareous plaques.

It may be of interest to state that, although this man while an inmate of the hospital had never complained of any gastric uneasiness, the stomach was found to be in a most extraordinary condition. It was contracted to a capacity much less than one pint, with greatly thickened walls, several small non-perforating interior ulcers, hypertrophied mucosa, and other evidences of long-continued and severe gastritis. No examination of the brain was obtained.

III. G. H., corporal U. S. M. C., æt. 36 yrs. and 7 mos; native of Prussia; admitted December 7, 1888; had been previously under treatment at the hospital with a severe attack of malarial fever and discharged as recovered. Upon admission at date above, his illness is attributed to "exposure to wet and cold." General physical condition in appearance excellent; appetite good. Has cough, with frothy expectoration. Dulness over the lower lobe of left lung, harsh râles over the whole chest. Temperature and pulse normal. For two weeks the cough was well controlled by the ordinary remedies, but about December 26, he began to complain of great pain upon coughing. The expectoration of white, frothy, non-purulent fluid continued, respiratory murmur in right lung strongly puerile, and right side resonant on percussion (emphysema), left side dull, but no râles now distinguishable.

December 28—In the præcordial region there was intense pain, continued down the left arm; appetite poor, stomach irritable; otherwise not much change.

December 29—Pain somewhat relieved, but still severe; left lung absolutely flat; persistent cough, with increased expectoration; no pus in sputa; temperature and pulse both normal; occasional nausea. It was not until this time that the existence of an aneurism of the thoracic aorta was suspected, but upon careful auscultation no bruit could be heard, neither was any tumor discernible. He was kept in a recumbent position, and the cough and pain modified as far as possible by morphia hypodermically.

December 31—Symptoms unchanged, except that the pain is not quite so severe; temperature and pulse normal.

January 2, 1889—Temperature 99.3° F.; pulse 90, regular.

January 3—In the morning the patient expressed himself as feeling much better, and almost free from pain; temperature 99.8° F.; pulse 90; some appetite: At 11 A. M. he was seized with a violent attack of coughing, with expectoration of half a pint of bright red frothy arterial

blood, great pain and dyspnœa, and in less than five minutes he was dead.

Autopsy.—No rigor mortis six hours after death; no emaciation. Thorax: right lung emphysematous, slight effusion into right pleura; left lung completely collapsed and solidified (carnification); left pleural cavity contained two pints of uncoagulated blood; pericardium and heart normal; aorta, ascending portion perfectly normal; below the junction of the transverse with the descending portion was a tubular aneurism three inches long and two inches in transverse diameter. The tumor was adherent to the trachea near its bifurcation, and to the left bronchus, with occlusion of the latter, and at this point the rupture by erosion had taken place. There was no evidence of degeneration of the arterial coats at any other part. Trachea and bronchi filled with clotted blood, otherwise normal; abdominal viscera healthy. The condition of the left lung in this case was interesting. It was so completely hepatized or carnified that not a vestige of air cells remained. This rapid solidification of the pulmonary tissue could hardly be accounted for by recent closure of the left bronchial tube alone. An eminent French physiologist has shown by actual experiment that section of one of the vagi nerves in the cervical region, causes speedy pulmonary consolidation on that side, and the peculiar state of the lung above referred to, according to this view, was due to pressure upon the left vagus nerve (pulmonary branches) by the aneurismal tumor where it involved the left bronchus.

IV. D. M., sergeant U. S. M. C., æt. 45, native of Ireland. Admitted October 25, 1880. Gives a history of previous ill-health extending back for an indefinite period, chiefly weakness, indigestion, constipation, and thoracic and lumbar pains. He was complaining of these pains at the date of admission, particularly in the left lumbar and præcordial regions. There was a marked degree of emaciation, and a sense of great debility. Among the abnormal sounds heard upon auscultation, could be distinguished a strong mitral regurgitant murmur, and the aneurismal bruit. There was an extensive area of dulness upon percussion around the præcordia. The hypertrophied heart was acting with great force, while the pulsations at the wrist were weak and unequal, and on the left side almost imperceptible. Pulse about 120, but very irregular. There were occasional attacks of "palpitation." Apex-beat in the fifth intercostal space, to the left of the nipple-perpendicular. He bore the scar of an old shell-wound in the lumbar region on both sides.

There was no material change in the condition of this patient for some months, except that a notable fulness appeared above and below the left clavicle. The pain was so severe at times as to require morphia at night in considerable doses in order to obtain rest.

February 7, 1881.—In the evening he was suddenly seized with an alarming attack of palpitation, with violent action of the heart, weak pulse, cold extremities, and labored respiration, and was much agitated at the prospect of impending death. Stimulants and revulsives soon rallied him however, and he passed the remainder of the night comfortably. At this time the temperature was from 99°–100° F.; the highest recorded at any time was 100.4° F. The stomach was constantly intolerant of solid food, and the diet was selected with regard to easy digestibility and assimilation, and nutritious qualities, but there was a continual struggle against inanition. Milk, soft eggs, beef tea, milk punch, and later dried bullock's blood, London company beef extract, "liquid food," etc., were the chief articles tried, and under this regimen he regained a considerable degree of strength. There were always complaints of indigestion, and constipation of the bowels; to the latter aperients and purgatives usually failed to give much relief, enemata being found more useful.

On February 26 he began to complain of pain in the right lumbar region, numbness of fingers, partial sweats, for instance sometimes of one arm only, but by the middle of March it was noted that he was somewhat stronger than usual. In May he was able to sit up often and even went out to the grounds, with assistance up and down stairs, so as not to exert himself. His stomach, however, was generally so weak and capricious that he was only able to take a very small amount of nourishment.

In July and August the pain on the left side was much diminished, but increased in severity in the right hypochondriac and right lumbar regions, and the pulse became about equal in the two radials. At the beginning of September he had gained in weight and general appearance very perceptibly, and began to contemplate making an early visit to his family and friends.

On the night of September 20 (10:30 P. M.) at which date he had been an inmate of the hospital 329 days, an event occurred which had been expected daily for several months. The aneurism ruptured, causing instant death.

Autopsy revealed a vast aneurismal sac, extending from the seventh dorsal to the first lumbar vertebra, and 6½ inches in breadth. It had burst on the left side, into the left pleural cavity, which contained eight pints of serum and coagula. The pericardium appeared to be entire, nevertheless it held nine ounces of blood. The bodies of the vertebræ corresponding to the aneurismal tumor were eroded, leaving the intervertebral cartilages uncovered and prominent. The articulating surfaces and ligaments of the ribs were also destroyed. Heart not greatly hypertrophied; weight, empty, ten ounces; wall of left ven-

tricle five-eighths of an inch thick ; calcareous deposits in aorta and on aortic valve ; pulmonary valve insufficient ; chordæ tendineæ of tricuspid valve shortened ; mitral insufficiency. Abdominal aorta contracted to about half the normal caliber. Anomaly of the left primitive carotid artery, that vessel having its origin from the innominata.

Not the least interesting feature of this case was found in the condition of the stomach. That organ presented an example, on not a very large scale, of the pathological state known, for want of a better name, as "dilatation of the stomach." It was of about twice the natural dimensions, and was simply a thin, pale, inert sac, partly distended with flatus. The muscular coat, including the pyloric sphincter, was atrophied, and the rugæ and gastric follicles quite obliterated, leaving the internal surface smooth and shining. It had been manifestly incapable of peristaltic action, and probably without any digestive power whatever.

The true pathology of dilatation of the stomach appears to be not well defined, except when purely mechanical, as from pyloric stenosis, or gradual distension by bulky ingesta. In this case it would seem to be a rational inference that the pressure of the aneurismal tumor upon the pneumogastric nerves, and consequent abolition of their functions, operated as a direct cause. The persistent constipation of the bowels, and the small effect of purgatives, might very well be accounted for also in this way.

V. During the evolution of loosing sails on board of a U. S. naval vessel at anchor in harbor, a man fell from aloft, struck against some part of the rigging, went overboard, and was taken from the water dead. The incident was worked up by the local newspaper reporters as an instance of inhumanity to sailors in the public service, the man having been just released from confinement on reduced diet, for breach of discipline. It was alleged he had fallen on account of weakness, the result of his punishment. An investigation was ordered and the remains were disinterred for examination. The body was that of a muscular adult entering middle life ; weight about 175 pounds ; no external injury ; no emaciation. The principal lesion discovered at the autopsy was an aneurism of the ascending portion of the arch of the aorta chiefly involving the intra-pericardial part, which had ruptured within the pericardium, filling it with blood by which it was distended nearly to its utmost capacity, and of course causing immediate death. There was hypertrophy of the heart, and dilatation of the coronary arteries.

VI. A. B., private U. S. M. C., between forty and fifty years of age. Unable to do duty on account of pain and debility upon muscular exertion. Had a moderate cough, attended by some pain ; dyspnœ

constant, although not very severe; respiration accelerated. There was a mitral murmur, and also a rough souffle on the upper right side of the chest near the sternum; skin of the upper extremities and thorax congested, but not cyanosed; superficial veins of the neck and chest very full and strikingly prominent. This man was discharged from the hospital by the expiration of his term of enlistment, and expressed his intention to "recuperate" for two or three months, and then re-enlist. He died suddenly a few days after reaching his home.

VII. J. F., a middle-aged musician. No history of ill-health, and no record pointing to aneurism. He died suddenly from the bursting of a large aneurismal sac of the arch of the aorta, while in the act of performing upon his instrument, the E b bugle. On account of its great size, the specimen was preserved for some time, and it was regarded as remarkable that such a tumor should exist without giving rise to symptoms.

VIII. C. M., fireman, first class, æt. 40, native of Ireland. Admitted into the hospital as with phthisis pneumonica chronica. At date of admission he was evidently in extremis. Respiration labored and difficult, amounting to orthopnœa, coarse tracheal râles, dysphagia, aphonia, insomnia, (the latter mostly from the embarrassed breathing) pulse weak, rapid and fluttering, intermittent, and at times quite imperceptible at the left wrist; purplish and cyanosed hue of the general surface; chest non-resonant on percussion. He died of exhaustion and apnœa on the sixth day after admission.

Autopsy: Both lungs infiltrated with pus, pulpy and anæmic; tuberculous nodules, undergoing calcareous degeneration in upper lobes. The trachea was flattened and almost completely closed by the pressure (with adhesion) of an aneurism springing from the arch of the aorta. The tumor was solid and heavy, as large as a full-grown Seville orange, and contained a spongy-appearing but very firm fibro-sanguineous mass nearly filling it, around which the circulating blood found its way only in a thin stratum.

The fact that even in the commonest cases the necropsy often develops something unexpected was here exemplified by the condition of the descending colon, which was reduced in size to a mere cord, still pervious however, admitting a medium catheter.

U. S. Naval Hospital, N. Y., October 30, 1880.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

THE METHODIST EPISCOPAL HOSPITAL.

The officers of this institution, which is popular known as the Seney Hospital, have published their first annual report, and a most creditable report it is.

The total number of cases admitted into the surgical division of the Hospital has been 203; of these, 131 have been discharged cured, 20 improved, 6 unimproved, and 16 by death; 30 remain in the hospital under treatment. Of the 173 whose surgical histories are complete, 56 have been injuries, 8 have been acute inflammatory diseases, 58 have been chronic inflammatory diseases, 18 have been tumors, and 33 miscellaneous diseases. In the treatment of these cases, 239 surgical operations were performed. A detailed account of many of these is given. The materials which have been used in the surgical dressings of these cases are a cheap cotton fabric, known as butter-cloth; thin manilla paper, cut into strips; and ordinary pine sawdust. By the skilful preparation and manipulation of the substances, all the requirements of the most rigid antiseptic surgery have been met. The total cost of these dressings has been but \$331.

In the medical division of the hospital 112 cases were treated during the year. Of these 44 were discharged cured, 29 improved, 8 unimproved, and 8 died.

The amount of money which has been paid for the support of the hospital or pledged for that purpose is \$200,000. The disbursements from May, 1884, to November, 1888, are \$71,131.

The report contains a tribute to the late Dr. Thallon, in which his services to the Hospital are spoken of in the highest terms.

A training school for nurses has been established in connection with the institution, the course extending over a period of two years and including the branches of study generally adopted in such schools.

Taken as a whole, the report is a valuable one, and might well serve as a model for the other hospitals of the city, but few of which make any annual report worthy of the name, showing the amount and quality of the work which they do. That the Methodist Episcopal Hospital is able to present any report at the end of the first year of its active life speaks well for the energy and efficiency of its managers; that it is able to show such a large amount of valuable professional work done, is a testimony to the skill and industry of its medical staff.

INFANTICIDE IN CHICAGO.

Is Chicago, so far as infanticide is concerned, worse than other large cities? This question suggests itself after reading the experience of a female reporter of a Chicago newspaper. The *Chicago Times* sent such a reporter to the physicians of that city representing herself to be unmarried and pregnant, and desiring treatment to produce abortion. Several of the physicians appealed to prescribed for her, and some informed her where she could receive the necessary local treatment to effect her object. So far as we have been able to learn, the well-known and reputable physicians were avoided to a considerable extent by the reporter, and those whose advice was sought were, as a rule, prompt to dismiss her unceremoniously. The *Times* gives the interviews, and, as a result, has been already called to account in the courts. There is, we presume, hardly a physician of any considerable practice, either in city or country, who has not been asked to relieve by medicine or surgical interference, persons who have illicitly or unwillingly become pregnant. Nor are such patients found only in dispensary practice. It is to be hoped that the physicians of Brooklyn would stand the test, should it ever be made, with even more honor to the profession than did those of Chicago.

REGULATING MEDICAL PRACTICE.

An effort will probably be made during the present session of the legislature of the State of New York to amend the Medical Act of 1887, by taking from the medical colleges of the State the power to grant diplomas, and placing that power in a Board of Examiners appointed for the purpose. Theoretically, there can be no objection to such a law. It would be a crucial test of the work done in medical colleges, if candidates for a degree were obliged to present themselves before an impartial board and satisfy its members that the requirements of the law had been fulfilled, and that the applicants were qualified to practice the healing art.

The difficulties in the way of the organization of such a board are, however, very great. Following the natural tendency of similar organizations in this State, it would be very difficult to keep the matter out of politics, and all know of how much value a political board would be, and what the probabilities are that such a board would be any improvement on the present system. Every physician is not, by any means, qualified to become an examiner; and, from the very nature of things, the most competent men are those who have had experience

in conducting examinations, which they could only get by being connected with medical schools. To place these men on the board, unless each school were granted a representative, would at once excite jealousy and opposition to the bill, and, if the act were amended, would place a board thus constituted constantly in jeopardy of having its action misconstrued. Again, the candidates for graduation, annually in this State, are so numerous that a physician could hardly be an examiner and conduct his practice at the same time, and it would be an arduous task to persuade the legislators that a sufficient salary should be given such men to enable them to devote most of their time to the examination of students for the degree of doctor of medicine. If these obstacles can be overcome, we shall rejoice to see the law amended, and shall do what we can to bring about the desired result.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

At the annual meeting of this Society, held January 15th, the following officers were elected for 1889:

President, Dr. A. R. Matheson; Vice-President, I. H. Barber; Secretary, Dr. W. M. Hutchinson; Assistant Secretary, Dr. D. Myerle; Treasurer, Dr. W. B. Chase; Librarian, Dr. J. H. Hunt; Censors, Drs. J. C. Shaw, J. W. Hyde, E. Palmer, W. Maddren and G. R. Hall. Trustee, Dr. A. J. C. Skene. Delegates to the State Medical Society, Drs. G. R. Fowler, C. E. De la Vergne, F. E. West, H. L. Bartlett, G. A. Evans, L. S. Pilcher, W. Maddren, B. F. Westbrook, F. D. Bailey, C. N. Cox, R. L. Dickinson and S. A. Fox.

BROOKLYN PATHOLOGICAL SOCIETY.

The following officers were elected at the annual meeting of the Society for the year 1889: President, Dr. John C. Shaw; Vice-President, Dr. A. H. Buckmaster; Secretary and Treasurer, Dr. R. G. Eccles.

PROGRESS IN MEDICINE.

SURGERY.

BY GEORGE R. FOWLER, M. D.,

Surgeon to St. Mary's Hospital and to the Methodist Episcopal Hospital.

FURTHER INQUIRIES CONCERNING THE ORIGIN OF SUPPURATION AND ITS RELATION TO PTOMAINES, ETC.

Dr. Scheuerlein (*Archives f. Klinische Chirurgie*, Bd. 36, Heft 4, 1888, p. 925). It has been demonstrated by actual experiment that neither croton oil, turpentine, or other chemical irritant, possesses the power of setting up genuine suppuration, which is only brought about by the presence of micro-organisms. Their ultimate mode of action upon the tissues is not thoroughly comprehended, but is supposed to be only a chemical one. Very few bacilli possess the power of performing voluntary movements, but by their enormous proliferation compress the tissues and plug the vessels. Experiments with ptomaines have hitherto only produced symptoms of general constitutional disturbance, but not localized pus formation. S. commenced by exposing a half pound of chopped rabbit's flesh to a temperature of 25° C. for ten days, occasionally shaking it, then straining it to separate the larger pieces, and boiling again to remove the albumen, and again filtered. It was then boiled down to ten cc. and again filtered, after which he obtained a clear brown liquid, intensely fetid, for the most part neutral. A cubic centimetre of this, injected under the skin of a rabbit, produced only general constitutional disturbances, with some rise of temperature. Absorption continued so rapidly that no local phenomena were perceptible. He then filled a small glass tube with this liquid, which on being exposed to the air continued to decompose, having previously exposed it for thirty minutes to Koch's disinfectant vapor bath, and introduced the tube under the skin of a rabbit, allowing the wound to heal over it. The tube was introduced into an incision at the sacro-iliac junction, and pushed, after closing the wound, as far away from the point of entrance as possible under the skin and fascia. The wound healed promptly where the experiment was carefully conducted. At the end of three weeks the tube was broken. On opening the skin over the tube, both ends of the tube having been broken off, the latter was found to be stopped with a yellowish white substance of the consistency of broth, four mm. in thickness; the rest of the contents were only slightly clouded. The substance

spoken of was only found in the ends of the tubes. On microscopic examination of the last named, it was found to possess all the characteristics of pus (pus corpuscles suspended in a thin liquid). Bacteria could not be found, either on microscopical examination or after cultivation at a temperature of 36° C. The process did not resemble natural suppuration, or possess its progressive character. Even after remaining eight weeks no change occurred, showing the fundamental difference between fibrinous and suppurative inflammation. This suppurative exudation would only coagulate when treated with a solution of common salt. The micro-organisms most frequently found in suppuration are the *staphylococcus aureus* and *albus*. From various experimental investigations, S. has reached the conclusion that suppuration is not brought about by any one particular micro-organism, but by several different varieties.

UPON THE FUNCTIONAL PROGNOSIS OF TENDON SUTURE.

Dr. F. Wolter (Archiv f. Klinische Chirurgie, Bd. 37, 1. Heft, p. 157). W. examined into the histories of thirty-four patients treated at the Hamburg General Hospital. The two principal conditions necessary for a full restitution of function are: 1st, continuity in normal length, whether by direct union or by the interposition of cicatricial tissue; and, 2d, restoration of normal mobility. These conditions are controlled partly by the course of the wound in the process of healing, and partly by the anatomical relations of the particular tendons injured. For instance, wound infection is quite certain to lead to necrosis of tendon, and the prognosis varies between injuries of extensor tendons and those of the flexor tendons.

In the course of repair of a divided tendon, there is a ring-shaped formation of scar tissue in the cellular sheath. This, by its connection to the surrounding structures, interferes more or less with the restoration of function. In favorably situated tendons, however, this may be overcome by use. The regeneration of tendons through the cellular sheath is at times complete; in others, isolated in long synovial canals, particularly when these latter are connected to bone, the regenerative process does not follow so favorable a course.

Deficiency of extravasation of blood may act as a cause of the insufficiency of regenerative effort, as proven by the experiments of Pirogoff upon the tendo Achillis. It would seem that the new tissue formation necessary for complete regeneration of a tendon depends upon the presence of a certain amount of inflammatory irritation. Modern methods of wound treatment, therefore, with its arrest of all hæmorrhage, complete drainage, absorbent dressing, and dessication of the same, is calculated to hinder rather than favor the regener-

ation of tendons. Shede's method of treatment under the clot or moist scab may be considered a great advance in the treatment of injured tendons. Arrest of hæmorrhage is not deemed necessary except when large vessels are wounded. The blood clot filling the wound is covered by pieces of oil-silk protective to prevent dessication, and these again are covered by several layers of sublimate gauze, to absorb whatever overflow of discharge may find its way under the former. Fixation of the parts is secured by a moulded hard-rubber or other accurately fitted splint. The first dressings may be allowed to remain undisturbed for three or four weeks. Early soiling of the bandages by blood serum may not necessarily require anything more than another layer of sublimate gauze.

The advantages urged for this method are, first, primary union of the skin wound and, second, early union of the ends of the tendon, which latter admits of early movements, and therefore guards against abolition of function through adhesions. The only possible objection is that which suggests the great probability of sepsis. In a report to the German Surgical Congress of 1886, it was pretty conclusively proven that sublimate dressings and properly sterilized oil-silk over an aseptic wound constitute perfect safeguards against infection.

CRUDE SULPHO-CARBOLIC ACID AS A MEANS OF DISINFECTION.

E. Laplace (*Deutsche Med. Wochenschrift*, 1888, No. 7), following up his experiments which resulted in considerably increasing the antiseptic power of sublimate by the addition of acids, sought to obtain similar effects in carbolic acid. Realizing that the comparatively insoluble 25 per cent. crude carbolic acid is not available for disinfectant purposes, he added to the latter equal parts of crude sulphuric acid, heating the mixture and allowing it to cool. The result is a thick, black fluid, very easily soluble in water, which possesses undoubted antiseptic powers. For instance, it destroys the spores of anthrax, in a 4 per cent. solution, in forty-eight hours; a 2 per cent. solution will accomplish the same result in seventy-two hours. This is about equivalent to the performances of a 2 per cent. solution of pure carbolic acid. It would seem, therefore, that the principal advantage of this compound resides in its comparative cheapness.

THE HIGH SUB-PUBIC SECTION.

C. Langenbuch (Berlin, 1888, A. Hirschwald). The author, after a series of studies upon the cadaver, recommends that an opening be made between the root of the pelvis and the under edge of the symphysis pubis, in order to gain entrance to the bladder without injury to the neighboring important organs. He urges, as objections to the

perineal incision, injury to the urethra and lateral wounding of the prostate. Supra-pubic incision, on the other hand, may produce perivesical phlegmon; deficient drainage of the bladder is likewise mentioned as a disadvantage in the the last-named operation. The operation is described as follows: A λ -shaped incision is made, the upright portion of the inverted letter Y running down from the middle of the pubic symphysis and joining the lateral incisions corresponding to the edge of the pubic arch. The suspensory ligament is divided and pulled strongly downwards, and by short strokes of the knife, close to the bone, the arched pubic ligament and the transverse pelvic ligament are cut through. For the purpose of gaining greater room, the superior and anterior juncture of the corpora cavernosa and the transverse pelvic ligament are loosened, while the connective tissue of the same and the bone are left undisturbed. The parts are loosened from above downwards, detaching the ligamentum arcuatum carefully, in order to avoid injury to the dorsal vein of the penis. Care should be taken not to enter too deeply with the point of the knife, thereby injuring prematurely the venous plexus covering the anterior bladder wall. After detaching laterally the transverse pelvic ligament, a blunt elevator should be substituted for the knife, and even this instrument requires care in its use. The fissure between the pelvic arch and the tissues which have been separated from the same may require to be enlarged, exceptionally, this requiring incision of the transverse pelvic ligament somewhat from its middle outwards. Dilatation of the opening is further accomplished by means of a modified form of the glove-stretcher used by Volkmann in lithotomy. In this manner an opening into the bladder can be made, in a vertical direction, from four to five ctm. long. Before opening the bladder, however, the plexus of veins lying upon its anterior and lower wall must be pushed aside. In case this portion of the bladder does not descend below the pubic arch, it can be made to do so by filling the viscus and making pressure from the abdominal side. The previous introduction of a sound will serve as a guide to mark the site of the internal opening of the urethra. With a narrow-bladed knife, the edge of which is directed upwards, the bladder is entered about one ctm. above the latter point. In the withdrawal of the knife the anterior bladder wall is incised in the median line and in an upward direction.

From the opening thus made, exploration of the entire bladder may be accomplished, particularly the region of the trigone and ureters. Many calculi are of a size sufficiently small to admit of removal through this opening, and the same may be said of some tumors. Should supra-pubic section become necessary, the sub-pubic section may be utilized for the purpose of drainage.

Finally, the author has demonstrated that injury to the dorsal vein of the penis, possible in the operation, does not interfere with the mechanism of erection of that organ.

UPON MOVABLE BODIES IN JOINTS.

König (*Deutsche Zeitschrift f. Chirurgie*, Bd. xxvii., p. 90). The author, discoursing upon foreign bodies in the joints, asserts, what Hueter had already noticed, namely, that after the knee-joint, the elbow-joint is affected next in frequency with this condition. For instance, there were operated upon in the Göttingen clinic, within a year, three cases belonging to this latter class; besides, during the same time numerous elbow-joints were found in the dissecting room which contained free bodies. The three cases operated on were young individuals, who had been suddenly attacked with pain in the elbow-joint, appearances of synovitis, with effusion, swelling and limited motion, with restriction of the movement of extension, particularly. In two cases, before operation, the movable bodies could be demonstrated at the front of the joint. In the third case the operation revealed the body at the front of the radial side of the joint. This condition explains the interference with extension, in that the capsule becomes stretched over the movable body before extension is completed; on the other hand, when the bodies pass between the joint surfaces to the posterior portion of the same, the arm can be completely extended. It therefore appears that the symptoms occur when the body passes under the anterior portion of the joint capsule. The removal of the movable body resulted in immediate restitution of the joint functions.

UPON OPENING DEEP PERI-RECTAL ABSCESES BY PERINEAL INCISION.

H. Zeller (*Beiträge zur Klinische Chirurgie*, Bd. iii., Hft. 2). Referring to the abscesses above the pelvic diaphragm, Z. states that these are usually found in the prostatic and peri-prostatic connective tissues. Abscess of the prostate itself is most frequently the result of irritation in the urethra; rarely by propagation of an ulceration from the rectum. Abscesses occurring primarily in the peri-prostatic connective tissue, and involving the prostate secondarily arise from extension of inflammation, or infection from neighboring organs. Further, ulceration of the bowel high up, (stercoraceous abscess) may produce abscess in this locality. Abscesses originating in the vertebræ seldom find their way to this locality. Lastly, a series of cases is mentioned, in which the cause is not noted.

Rupture of an abscess purely prostatic in its origin occurs oftenest in the urethra, and at times is characterized by an intermittent discharge of pus; it very seldom breaks through into the bladder. Ab-

scuss of the peri-prostatic tissues open oftenest into the rectum; next in frequency into the urethra, and often into both rectum and urethra. They seldom point spontaneously towards the perineum, and are quite as likely to follow a direction towards the inguinal region, the ischio-rectal fossa, or the obturator foramen.

The prognosis of deep perineal abscesses is unfavorable. In 114 cases, 70 were cured, 7 terminated in fistulæ, while 34 died. The importance of early interference is insisted upon. The perineal incision recommended by Lallemand, even when no prominence in the perineum is observed, and when but slight arching toward the rectum can be felt, is recommended.

When decided bulging and fluctuation are observed in the rectum, there is a temptation to incise at this point. The fact that the rectal opening cannot be made sufficiently large for purposes of free drainage; that it is often not at the most dependent portion of the abscess; and further, the impossibility of antisepsis, and the risk of establishing a urethro-rectal abscess in the cases in which spontaneous opening into the urethra also occur;—these considerations together with the danger of hæmorrhage, will impel the surgeon to adopt the course recommended by the author.

UPON PERINEAL HERNIA.

Ludwig Ebner (*Deutsche Zeitschrift f. Chirurgie*, Bd. xxvi., p. 48,) made an especial study of the frequency of those fissures or openings in the pelvic floor which serve as exits for perineal hernia. In 42 male and 18 female cadavers, ranging from 13 to 81 years old, upon which these observations were made, E. found, in 25 individuals, 47 fissures in the levator ani muscle. In one case he met with a protrusion of the rectal wall through a fissure in the levator ani (rectocele perinealis). This is analogous to a condition quite frequently met with in dogs, and which occurs between the levator ani and the curvator caudæ muscles. E. combats the theory that these herniæ are the result of injury or intra-abdominal pressure, and declares his belief that they arise from a congenital condition, involving a diverticulum-shaped projection of Douglas's cul-de-sac below the normal level.

PYEMIA OF DENTAL ORIGIN.

Arthur W. W. Baker (*Dublin Medical Journal*, July, 1838). A woman, æt. 23, consulted Dr. B. with the history of having suffered from an alveolar abscess at the site of the first upper molar, which latter had been filled at the age of 19. Ten years later another acute abscess occurred in the same region, followed by an abscess of the fourth toe of the right foot, and small abscesses in other parts of the body. An abscess in the right ear followed. About a week previous to consulting Dr. B. she had an abscess at the site of the same tooth;

this being followed by an abscess in the forearm, which upon examination presented the appearance of a small pyæmic abscess. Free incision around the tooth and removal of all dead and decomposing pulp from the tooth itself, together with antiseptic treatment of the incised parts, resulted in a cure.

NOTES UPON THE SYNCHRONOUS OCCURRENCE OF CARCINOMA AND TUBERCULOSIS.

Lularsch (Virchow's Archiv., Bd. cxi., p. 280,) has examined two cases of primary carcinoma in individuals, who at the same time were suffering from tuberculosis. He discusses the synchronous occurrence of the two diseases, basing the study of the same upon sections from the Breslau Pathological Institute, and declares a causative relation between the two to be possible in the sense that tubercular affections as well as chronic local disturbances arising from other causes, can favor the development of carcinoma.

THE SPONTANEOUS RUPTURE OF THE COLON OF THE NEW-BORN.

Paltauf (Virchow's Archiv., Bd. cxi., p. 461). Supplementing Zittner's communication (Virchow's Archiv), Bd. cvi., quoted in Centralblatt f. Chirurgie, 1885, No. 6, p. 103,) upon rupture of the sigmoid in the new-born during the birth, the author observed five analogous cases, among which were some with several ruptures, occurring over the whole length of the colon. Hence he concludes that the compression to which Zittner ascribes the accident, could not be the sole cause of the rupture. The rupture and tearing of single layers of the wall of the bowel is induced by a destructive process ("Gewebnekrose"), which attacks, not only the mucous membrane, but the muscular structure and submucous layer of connective tissue as well, the latter succumbing last. P. advances the opinion that this process is induced by overfilling of the colon with meconium, and that occurrence of a multiplicity of perforations suggest of themselves previous changes in the tissues. He thinks these cases analogous to perforation in the adult due to intestinal obstruction from fecal impaction. Active peristalsis and abdominal pressure may hasten perforation, or lead to a single rupture of the walls of the gut, but would be scarcely likely to perpetuate it.

SARCOMA OF THE SCALP.

P. S. Conners, M.D. (Journal of American Med. Association, Vol. xi., No. 7). A tumor of the scalp, in the occipital region, which for thirteen years had undergone no noticeable change, began to enlarge until an accouchement, when it underwent rapid growth, accompanied with considerable pain, at times severe. It measured twenty-one

inches in circumference, and was movable. After removal, it was found to weigh almost five pounds, and, upon examination, proved to be a spindle-celled sarcoma. At the end of eighteen months a recurrence of the disease took place, which, after another confinement, grew rapidly to the size of eighteen inches in diameter. It was again removed, and, in this instance, no attempt to save the covering was made. Five weeks afterward, the patient left for home with the granulating wound in excellent condition.

The rarity of cases of sarcoma of the scalp renders the one recorded of exceeding interest.

TREATMENT OF HYDROCELE BY A NEW METHOD.

W. F. McNutt (*Phila. Med. News*, Vol. liii., No. 7, p. 181). The author believes the frequency of failure of the method by tapping is due to the fact that reaccumulation of the fluid takes place rapidly, thus preventing the formation of adhesions between the surfaces of the tunica vaginalis testis. He proposes to obviate this by leaving the canula in situ sufficiently long to enable the fluid to escape as it reaccumulates, and applying absorbent cotton, oil silk and suspensory bandages. Four cases have been treated by McN. The first case was cured, the canula remaining in place for thirteen days. A few drops of pus formed in and about the canula. The second case disappeared, canula and all. In the third case, some uneasiness was occasioned by the presence of the canula, and it was removed. In the fourth case, the canula dropped out. In the latter two cases, fluid reappeared, and was removed by tapping, the patients objecting to the use of injections.

It seems to us the treatment recommended has no advantages over the old treatment by seton, and like the latter, it renders the patient liable to septic infection, not only of the tunic itself, but of the connective tissue of the scrotum.

REMOVAL OF A WANDERING SUBSTERNAL CYST.

Prof. Roser, of Marburg (*Centralblatt f. Chirurgie*, No. 31, 1888). The patient, a man of 35, applied to R. for the relief of dyspnœa occasioned by the presence of a tumor, which, during the act of coughing, arose from behind the sternum, and rested against the left side of the larynx. During inspiration the tumor disappeared entirely. R. operated as follows: Transverse incision at the superior edge of left clavicle; sterno-mastoid muscle divided at its sternal attachment; a large vein encountered was divided between two ligatures. The deep fascia and anterior edge of the sterno-thyroid muscle was then exposed, when the finger could be passed into the substernal space touching the tumor. It lay entirely behind the sternum, at this stage of the opera-

tion, but by allowing the patient to partially come out from under the anæsthetic, and bidding him to cough, the tumor was forced out against the larynx. It was at once seized by tenacula forceps, and held, while being emptied of its contents. The vessels of the pedicle were ligated with catgut, and both sutures and drainage were omitted. The cavity was carefully irrigated with sublimate solution, and the healing process advanced with such rapidity that the patient was dismissed from observation on the ninth day.

ON THE RELATION OF CERTAIN GLAND DISEASE TO OTHER FORMS OF
TUBERCULOSIS.

Mr. F. S. Eve (British Med. Journal, April 14, 1888, p. 788,) recently undertook a series of experiments having for their object the determining of the relation of so-called scrofulous gland disease to tuberculosis in its other forms. The view that scrofula and tuberculosis were the same disease has been held by some, while others have maintained that in scrofula the tuberculous virus was so modified as to constitute a special variety. M. S. Arlonig (Comptes Rendus, tome xcix, 1884., p. 661,) made some experiments which tended to prove that material from scrofulous glands was innocuous to rabbits, while it produced general tuberculosis in guinea pigs. On the other hand, material from true tuberculosis will produce visceral tuberculosis in both animals. In Mr. Eve's experiments it was demonstrated that the inoculations uniformly caused tuberculosis, although in rabbits it was not so acute nor rapidly fatal. The difference, however, is one only of degree, not of a kind permitting us to infer, with Arlonig, that struma is a specialized form of tuberculous virus.

The occurrence of cervical adenitis without apparent cause, and the fact that it frequently runs an innocent course, as clinical observation shows, is probably explained by the fact that the common bacillus is implanted in the lymph follicles of the pharynx or tonsil, and is carried directly to the gland, where it is arrested. Here it may remain for a long time without doing any further harm, but if an inflammatory action with suppuration occurs, the soil necessary for the development and growth of the bacilli is at once present. Should ulceration, or an extensive peradenitis occur, general dissemination may result. It, therefore, may with propriety be urged that early operation for the removal of these diseased glands holds out a hope of completely eradicating the disease.

THE INJECTION OF A SOLUTION OF COCAINE INTO THE URETHRA FOLLOWED
BY DEATH

J. H. C. Simes (Phila. Med. News, Vol. liii., No. 3, p. 70). Immediately following the injection of a drachm of a 20 per cent. solution

of muriate of cocaine into the urethra by means of a long nozzled syringe, which passed about four inches into the canal, the following symptoms appeared: The patient made a foolish remark, the muscles of the face began to twitch, eyes staring, pupils dilated, frothing at the mouth, face muscles congested, respirations difficult, and finally an epileptiform convulsion lasting for several seconds. These latter recurred with increasing violence, the whole muscular system taking part. Action of the heart was not much interfered with. Death took place in twenty minutes from the first convulsion, the respiratory act failing first. Post-mortem showed only considerable congestion of the vessels of the brain to account for the catastrophe. Lesions, the supposed result of previous syphilitic infection, were found in the spleen and kidneys, as well as in the membranes of the brain.

RECTAL INSUFFLATION OF HYDROGEN GAS AS AN INFALLIBLE TEST IN THE
DIAGNOSIS OF VISCERAL INJURY OF THE GASTRO-INTESTINAL CANAL IN
PENETRATING WOUNDS OF THE ABDOMEN, WITHOUT LAPAROTOMY.

N. Senn, M.D. (Phila. Med. News, vol. lii., No. 21), submits the following proposition: 1st. The entire alimentary canal is permeable to rectal insufflation of air and gas. 2d. Insufflation of the entire alimentary canal from above downward, through a stomach tube, rarely succeeds, and should therefore be resorted to only in demonstrating the presence of a perforation of a wound of the stomach, and for locating other lesions in that organ or its immediate vicinity. 3d. The ileo-cæcal valve is rendered permeable by rectal insufflation of air or gas, under a pressure varying from one-fourth of a pound to two and a half pounds. 5th. Rectal insufflation of air, to be both safe and effective, must be done very slowly and continuously. 6th. The safest and most effective rectal insufflator is a rubber balloon large enough to hold four gallons of air or gas. 7th. Hydrogen gas should be preferred to atmospheric air or other gas for purposes of inflation in all cases where the procedure is indicated. 8th. The resisting power of the intestinal wall is nearly the same throughout the entire length of the canal, and in a normal condition yields to a force of from eight to ten pounds. When rupture takes place, it either occurs as a longitudinal laceration of peritoneal or visceral surface of the bowel, or as multiple ruptures from within outwards at the mesenteric attachment. 9th. Hydrogen gas is devoid of toxic properties, non-irritating when brought in contact with living tissues, and is rapidly absorbed from connective-tissue spaces and all of the large serous cavities. 10th. The escape of air or gas through the ileo-cæcal valve from below upwards is always attended by a blowing or gurgling sound, heard most distinctly over the ileo-cæcal region, and by a sud-

den diminution of pressure. 11th. The incompetency of the ileo-cæcal valve is caused by a lateral and longitudinal distension of the cæcum, which mechanically separates the margin of the valve. 12th. In gunshot or punctured wounds of the gastro-intestinal canal, insufflation of hydrogen gas enables the surgeon to determine positively the existence of a visceral injury, without the risks and medico-legal responsibilities incident to explorative laparotomy.

GUNSHOT WOUND OF THE ABDOMEN. PERFORATION DIAGNOSTICATED BY RECTAL INSUFFLATION OF HYDROGEN GAS. LAPAROTOMY. DEATH FROM SEPTIC PERITONITIS.

Wm. Mackie, M.D. (*Med. News*, Phila., Vol. lii., No. 23). The patient was etherized and rectal insufflation effected in the following manner: A four-gallon rubber bag, filled with hydrogen gas, was connected by rubber tubing with the long glass tube of an extemporized wash bottle, half filled with water. To the short glass tube, passing through the cork only, was attached by rubber tubing the rectal nozzle of an enema syringe. The object of this was to judge if the rapidity of the inflation could be judged of by the bubbling of the gas through the water. The rectal nozzle being introduced, pressure was made upon the bag, and the abdomen, previously flat, became resonant as inflation progressed. This was continued until the abdomen was uniformly distended. On pressure upon the abdominal walls, gas and blood escaped through the wound of entrance. Attempts to ignite the gas were unsuccessful.

Laparotomy by median incision showed the presence of considerable blood in the abdominal cavity.

Profuse hæmorrhage from the superior mesenteric veins was arrested by ligature. The stomach was empty and in it were found two perforations. At the junction of the duodenum and jejunum two perforations were also found. These perforations were closed by Lembert sutures of silk. The patient died thirty-six hours after the injury, of septic peritonitis.

GYNÆCOLOGY.

BY A. H. BUCKMASTER, M.D.

Gynæcologist to Hospital for Mental and Nervous Diseases; Assistant Surgeon to St. Peter's Hospital; Fellow N. Y. Obstetrical Society.

TREATMENT OF MENORRHAGIA AND DYSMENORRHEA BY HEAT AND COLD.

Dr. Kinnear (*Annals of Gyn.*, Oct., 1888) has an interesting paper on the effect of heat and cold applied over the cord and sympathetic ganglion to control the vascular territory presided over by these nerve

collections. In several cases of menorrhagia the author applied heat over the dorso-lumbar region, and quickly checked the excess of the flow. He says that as many patients do not lose blood in excessive quantity until the end of the second or beginning of the third day, it is not desirable to use the water before this time. Heat is applied by means of water bag, the water being at a temperature of from 115° F. to 120° F. The bag should be filled often enough to maintain this temperature.

Dr. Kinnear illustrates the use of cold by narrating a case of post-partum hæmorrhage, where the patient, who was pulseless at the wrist, immediately regained consciousness by applications of ice to the cervico-dorsal region. The explanation of the happy result attained was that the blood invited into the upper extremities and chest by the relaxation of the areas controlled by the ganglia affected by the cold, was so great that the arterial tension was lowered in the uterus sufficiently to permit a clot to form.

The author states that the application of cold in the form of an ice-bag over the dorso-lumbar region, in cases of dysmenorrhœa, will often give great relief.

[If the use of the hot and cold water bag proves to be of as great service as the above statements affirm, it is indeed a valuable resource. How useful in case of operations about the vagina it would be to be able to control even partially the flow of blood. And in secondary hæmorrhage, where one is unable to make the diagnosis with positiveness, it would be a great relief to know that we were not perfectly helpless. Of its use in hæmoptysis we will not speak.]

A NEW OPERATION FOR INCONTINENCE OF URINE IN WOMEN.

Dr. William Alexander, at a recent meeting of the British Gynæcological Society, mentioned a patient whose occupation compelled her to retain her urine for unduly prolonged periods of time. The result of this unnatural condition was a paralysis of the sphincter vesicae. To relieve the patient of this distressing condition, after trying other methods, the doctor dissected out the urethra and led it into the rectum, hoping to utilize the rectal sphincter for retention of urine. At the third attempt he succeeded, and the patient was much relieved. He also narrated two other cases where he operated for the relief of vesico-vaginal fistula by causing occlusion of the vagina.

NON-SURGICAL TREATMENT OF GYNÆCOLOGICAL CASES.

H. B. Storer (*Annals Gyn.*, Vol. I, No. 12), under this head considers the treatment of dysmenorrhœa. He advises antipyrin and opium for the pain, and in cases where visible pieces of membrane are

passed, accompanied by sharp colicky pains, sometimes almost unbearable, the use of the galvanic current is recommended. Dilatation and drainage may be tried, but of this he has little faith. In all morbid conditions of the endometrium, glandular, fungoid, or a mixed form, even in cases of simple uterine catarrh, he advocates the use of the dull curette, followed by an injection of iodine or application of carbolic acid. He insists upon observance of strict antiseptic measures. He sums up as follows :

1. Quiet pain with antipyrine.
2. Rectify dislocated uterus with cotton pessaries.
3. Restore a diseased endometrium by using the dull curette, followed with an injection of iodine or an application of carbolic acid, as the case may be.
4. Nervous spasm of the os may be overcome by galvanism.
5. For rigid os use rapid dilatation.
6. Uteri that are bound down by adhesions and surrounded with the exudates of prior parametritis should not be curetted, and the sound should not be used. In these cases general treatment by massage, electricity, and above all by the Moor baths, for which Franzensbad is so widely celebrated, together with hot water injections and tampons of glycerine, boro-glyceride, and glycerine and alum *should be used*, must be pushed perseveringly and with much patience.
7. Pessaries in the treatment of dysmenorrhœa are, generally speaking, an abomination.
8. Divulsion belongs to the surgeon, and its utility may be questioned.
9. The most general cause of dysmenorrhœa being a diseased endometrium, and this membrane being adenoid in nature and furnishing, as it were, from itself the periodic flux, the extirpation of the ovaries and tubes for the radical cure, is a questionable proceeding, and, in the present lamentable condition of ignorance of everything connected with menstruation, does not seem to be warranted by the necessities of the case ; certainly not until the endometrium has been properly treated.
10. To remove non-diseased ovaries and tubes for the cure of dysmenorrhœa is most irrational and illogical. For if the ovaries and tubes are necessary factors of menstruation, and if they themselves be healthy, it follows of course that the trouble must be elsewhere, either in the uterine mucous membrane or in the nervous system, in which case a surgical operation would be of no service, because menstruation often exists after it.

Menorrhagia.—Constitutional causes must be met on general principles. If due to myoma, use electricity, ergot and Cutter's system of

diet. In degenerations of the endometrium, the curette. Ergot in enlarged uterus and cannabis indica are valuable in combination, the former to contract the uterus and the latter to control the hæmorrhage. The doctor believes that the rest treatment could always be advantageously tried before resort to local treatment.

[We believe the use of the curette is clearly a surgical procedure, and insist upon its being looked upon in this light on account of the bad effects that sometimes follow its careless use. For the proof of this we refer the reader to another abstract.]

The *Boston Medical and Surgical Journal*, in commenting on ovariectomy and marriage, uses the following significant language :

"Women may, and do, marry without the husband being necessarily aware of the hiatus in the anatomical arrangements of his better half. A marriage contracted under such circumstances would from any point of view be immoral and contrary to public policy, and when one of the parties to the contract is left in ignorance of the facts of the case, it becomes a fraud of the most cruel description. Moreover, except with the assistance of the surgeon who was instrumental in removing the superfluous organs, it would be difficult for the outraged husband to prove his case, should he be tempted to resort to the law to relieve him of a mutilated and infertile conjoint. In years gone by, the question was one which might well be left to the debating societies to discuss, but in view of the extension which the practice of extirpating ovaries has taken of late years, it becomes one of practical interest. If it be hard on the man to give him a wife minus her appendages, it is adding insult to injury to give him for a wife a woman who has not even a uterus to call her own. Yet Mr. Tait was enabled to record the cases of three young women, wombless and appendageless, who had subsequently reported favorably on the matrimonial condition. Where the operation in the case of either conjoint has been performed subsequently to marriage, no difficulty occurs, since each party to the contract has solemnly consented to accept the other for better or worse, but just as lepers are only permitted to marry *inter se*, so the only fit spouse for the woman without ovaries should be the man without testicles."—*Buffalo Med. and Surg. Journal*.

UNRIPE ORANGES IN METRORRHAGIA.

Valdés Castro, of Havana, mentions in a therapeutic note, published in the *Cronica Medico-Quirurgica*, that having heard Valle some years ago recommend the use of unripe oranges, boiled in their skins and well sweetened, in metrorrhagia when independent of organic disease, he has since that time employed this simple remedy in his practice, with excellent results. Indeed, he finds it more efficacious than more powerful drugs.—*The World's Medical Review*.

FLUSHING THE PERITONEUM.

The *British Medical Journal* calls attention in an editorial on this subject to a recent paper by M. Polaillon, who narrates two cases where he utilized this procedure with untoward results. In one case the patient died, and in the other the patient suffered from profound syncope.

The first case was one of suppurating oöphoritis on the left side and double salpingitis. Firm adhesions had to be broken down. The peritoneum was flushed with hot distilled water, and during the process profound syncope with suspension of respiration took place. After making a tracheotomy wound in the patient's neck, rapid amelioration of the symptoms occurred.

The second case was one where a large cyst had to be shelled out of the broad ligament. In order to flush out a considerable amount of effused blood, the operator employed distilled water delivered through a glass canula heated to about 99° F. This was followed by alarming symptoms on the part of the patient. The respiration became rapid, feeble, and finally ceased, and it was only with the utmost difficulty that the patient was finally saved. In regard to the amount of water used, M. Polaillon states that he first poured in about half a gallon of hot carbolized water, and as it came out strongly tinged with blood, more was used and accidentally at a higher temperature than that at first. The pelvis being full, the water reached the upper part of the abdominal cavity. It was at this moment that respiration ceased. The operator believes that the stimulus of the hot water touching the diaphragm or solar plexus caused, by reflex action, the arrest of respiration and syncope. He suggests in cases where flushing is necessary that the patient be raised up slightly so as to have the water gravitate below. The operation was done under the influence of chloroform.

[Was the death due, as M. Polaillon ingeniously suggests, to the effect of the hot water in the solar plexus or diaphragm ; to the chloroform ; to the carbolic acid ; or perhaps the patient lost too much blood !]

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MISCELLANEOUS.

VITAL STATISTICS FOR NOVEMBER, 1888.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Data of Comparison:

Population, estimated	805,885	The number of Births reported was.....	1166
Inhabited houses, about.....	93,500	The number of Marriages reported was.....	489
In the month of November there were 1225 Deaths, the rate of mortality being 18.62 per 1000 of population.		The number of Still-births reported was.....	113

The Mortality, by classes and by certain of the more important diseases, was as follows:

Causes:

1. Zymotic.....	265	Malarial Diseases	13
2. Constitutional	219	Diarrhoeal Diseases (all ages).....	17
3. Local.....	612	“ “ (under five years), ...	9
4. Developmental.....	87	Phthisis.....	155
5. Violence.....	42	Bronchitis	60
Measles.....	2	Pneumonia.....	130
Croup.....	38	All Respiratory.....	217
Diphtheria	103	Bright's Diseases.....	36
Scarlet Fever.....	16	Puerperal Diseases.....	5
Typhoid Fever.....	26	Old Age.....	15
Whooping Cough.....	25	Suicide.....	5

Reported Cases:

Diphtheria.....	270	Measles.....	95
Scarlet Fever.....	181	Typhoid Fever.....	111

During the month no cases of Small-pox were reported.

Deaths, by sex, color, and social condition, were as follows:

Male	623	Native.....	811
Female.....	602	Foreign.....	414
White	1208	Married.....	328
Colored.....	17	Single.....	716
Widows, Widower, and not stated.....			181

Still-births, excluded from list of deaths, were as follows:

Males.....	63	Total	113
Females	50		
Deaths in public institutions.....	100	Homicides.....	0
Deaths in tenement houses.....	546	Suicides.....	5
Inquest cases.....			137

Age Periods:

Deaths under 1 year.....	249	Total deaths, 5 to 20.....	115
“ “ 5 years.....	202	“ “ 20 to 40.....	234
Total deaths under 5.....	451	“ “ 40 to 60	219
		“ “ 60 and upwards	206

Certain foreign and American cities show the following death-rate for the month of November:

Brooklyn.....	18.62	Vienna.....	21.40
New York	20.88	Paris.....	21.99
Philadelphia	17.91	London	19.85
Berlin.....	19.98	Glasgow.....	21.10
Dublin.....			24.50

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 3.

BROOKLYN, N. Y., MARCH, 1889.

WHOLE No. 15

ORIGINAL ARTICLES.

BACILLUS DIPHTHERIÆ (LOEFFLER).

BY GEORGE M. STERNBERG, M.D., U. S. A.

Director of Hoagland Laboratory.

Lecture delivered at the Hoagland Laboratory, January 26th, 1889.

Numerous investigators have attempted to solve the question of the etiology of diphtheria by the experimental method, but, owing to the difficulties attending the undertaking and the imperfection of the methods of research employed, but little value can be attached to the results obtained by those whose work was done before Koch had given us a reliable method of isolating and differentiating micro-organisms. Culture experiments made with material obtained from the diphtheritic patches upon the tonsils, etc., showed that micro-organisms were present in abundance, and especially micrococci, which were cultivated by various observers, and supposed by some to be the specific infectious agent in this disease. No satisfactory proof was, however, presented in support of this view, and we now know that there are a variety of common micrococci present in the healthy human mouth, which are ever ready to invade the fibrinous exudate and the necrotic tissues of a diphtheritic sore throat, and that some of these are pathogenic species.

The attempts made by competent microscopists—Eberth, Weigert, Heubner, Furbringer, Loeffler and others—to demonstrate the presence of a specific micro-organism in the blood and tissues of fatal cases of diphtheria have not been successful. Even in the kidneys, which are seriously implicated in this disease, micro-organisms are only found by exception, and no specific form has been demonstrated. The same is true with reference to the deeper portions of the tissues directly involved in the diphtheritic process—the uvula, the tonsils, etc. This being the case the hypothesis presents itself that the specific infectious agent may remain upon the surface of the mucous membrane, or in the superficial portions of the tissues in which the specific local process manifests itself, and that the general symptoms of the disease are due to the absorption of a deadly ptomaine, produced during the active development of the diphtheria germ in its favorite nidus. We have ample evidence that the diphtheritic exudate contains the specific infectious agent, and that the disease may be transmitted in man by means of this infectious material. The most promising direction for experimental investigations relating to the etiology of the disease is therefore apparent, and it is in this direction that what now appears to be complete success has been obtained by the German bacteriologist, Loeffler.

Klebs,¹ in 1883, had observed the bacillus which Loeffler² subsequently cultivated and, by experiments upon the lower animals, demonstrated to have pathogenic properties, which gives support to the view that it is the veritable infectious agent in diphtheria.

The experimental demonstration, however, has not been generally accepted as entirely satisfactory, and conservative physicians have been waiting for confirmation by an independent investigator of the results reached by the German bacteriologist. This confirmation we now have in the extended experimental research by Roux and Yersin, published in the *Annales of the Pasteur Institute* (Dec. 1888).

In his sections of diphtheritic membrane Loeffler found a variety of micro-organisms, but his attention was especially attracted by two species—one a streptococcus, which he found especially in the diphtheritic sore throat of scarlet fever; the other the bacillus which Klebs had previously described, and which was found to be present in the greater number of cases of typical diphtheria.

The last mentioned bacillus was found in the layers of the false membrane which were in contact with the surface of the mucous membrane, and it was observed that they penetrated more deeply into the tissues than other micro-organisms with which they were associated in

¹ Congress of Wiesbaden, 1883.

² Mittheilungen aus dem Kaiserlichen Gesundheitsamte, Bd, ii., 1884.

the more superficial layers of the exudate. These bacilli were easily demonstrated in sections stained with methylene blue. Attempts to isolate this bacillus by the ordinary plate method were not successful, but by diluting very much a little material taken from the exudate in the fauces, and inoculating jellified blood-serum with small drops of this, Loeffler succeeded in obtaining his bacillus in pure cultures. The best culture-medium was found to be a mixture of three parts of blood-serum, from the calf or the sheep, mixed with one part of neutral veal-broth, to which had been added 1 per cent. of peptone, 1 per cent. of grape sugar and one-half per cent. of common salt. This medium was solidified in the usual manner by heat. The bacilli grew best at a temperature of 37° C., and formed upon the surface of the culture-medium little opaque white masses, or a thick white layer which reached its highest stage of development within forty-eight hours.

Wysokowitsch, working in the laboratory of Prof. Fluegge, of Goettingen, succeeded in isolating Loeffler's bacillus from the false membrane of diphtheria by the plate method, using the ordinary agar-agar jelly as a culture-medium. It was necessary, however, to repeat the "plating" several times in order to obtain pure cultures, on account of the great number of rapidly growing saprophytes present in the diphtheritic material. According to Fluegge growth occurs upon agar jelly at as low a temperature as 22°C. (71.6° F.), although at this temperature it is very slow and imperfect.

Recent colonies in agar plates appear, when highly magnified (80 diameters), as round or oval, granular, dark brown discs, the contour of which is not very sharply defined. The colonies are frequently united in such a way as to form irregular figures. Colonies upon the surface of the culture-medium have a yellowish gray color, a wavy margin, and a rough, almost reticulated surface. The bacilli, which are without proper movements, vary greatly in length, and are usually more or less bent. They are not of uniform diameter, but commonly present the appearance of having one or both ends expanded. When examined in a fresh condition, without the use of staining reagents, it will be observed that certain portions of the rods, and especially the extremities, are more refractive than the rest. These portions are also more deeply colored in preparations stained with Loeffler's solution of methylene blue. Not infrequently, also, the bacilli are seen to be divided into short, irregular fragments. When cultivated upon a medium not well adapted to their growth, various involution forms present themselves—the ends are very much expanded, or the middle portion of a rod may be thickened, or the rods present the appearance of being formed of round or oval fragments.

These involution forms might easily in some cases be taken for spores ; but the fact, demonstrated by Loeffler, that their vitality is destroyed by a temperature of 60° C. (140° F.) is opposed to the view that they are reproductive bodies. No spore formation has yet been demonstrated, and like the typhoid bacillus and many other pathogenic micro-organisms the thermal death point of this bacillus is comparatively low— 60° C., the time of exposure being half an hour (Loeffler). In old cultures the bacilli do not stain well. They retain their vitality in culture media, at ordinary temperatures, for three months or more. Roux states that he has kept bouillon cultures in hermetically sealed tubes for more than six months, and at the end of that time development occurred as usual in a fresh culture-medium. In a liquid medium, made slightly alkaline, the diphtheria bacillus multiplies rapidly, and the medium acquires an acid reaction. The addition of glycerine to a *bouillon* made from veal constitutes an excellent medium, according to Roux, in which the acid reaction is still more pronounced as a result of the development of the bacillus.

Loeffler, with true scientific conservatism, refrained from claiming positively the etiological rôle of this bacillus in diphtheria, and pointed out certain facts which had come under his observation which seemed opposed to this conclusion. First, he failed to find the bacillus in a certain number of typical cases of diphtheria ; second, his experiments upon animals showed that it was only when the bacillus effected a lodgment through a wound that the diphtheritic process was established in the fauces of susceptible animals, and that negative results were obtained when cultures were introduced upon the healthy mucous membrane. A more serious objection still was found in the fact that the same bacillus was recovered, in his comparative researches, from the mouth of a healthy child. As, however, it was only found once in a series of twenty children and ten adults in which the search was made, and as other observers, who have made extensive studies relating to the bacterial flora of the healthy human mouth, have not encountered Loeffler's bacillus, we are not disposed to attach great importance to this fact. It is extremely probable, in the light of our present knowledge, that pathogenic micro-organisms not infrequently gain access to the bodies of susceptible persons without producing disease. In the first place there is without doubt a limit as to the number introduced, below which no infection results. This is shown by the experiments of Watson Cheyne with various known pathogenic bacteria. Second, susceptibility no doubt differs not only in different individuals, but in the same individual at different times ; and, in diphtheria, it is extremely probable that a simple sore throat constitutes a favorable predisposing cause, in the presence of the specific infectious agent, corresponding perhaps

to the slight traumatism which Loeffler found in his experiments to be essential for the establishment of a diphtheritic process. The most serious objection, then, from our point of view, which Loeffler has advanced against the supposed etiological relation of his bacillus to diphtheria is his failure to find it in certain typical cases. Fluegge suggests the possibility that in those cases the bacilli had already undergone involution changes, and had lost their capacity for developing—or in other words were dead.

Loeffler recognized the bacillus in his microscopical examinations in the greater number of his cases (twenty-five), and isolated it in pure cultures in six.

He produced a diphtheritic inflammation, with formation of false membrane, in pigeons, fowls, rabbits and guinea pigs by inoculations upon mucous surfaces—conjunctiva, pharynx, trachea, vagina—which had previously been excoriated. Guinea pigs and small birds died as a result of subcutaneous inoculations, and presented in the vicinity of the point of inoculation an extensive cellulitis, with effusion of bloody serum. This is a result which occurs when similar inoculations are made with various other pathogenic micro-organisms. The bacillus was not found in the organs of animals which succumbed to these subcutaneous inoculations. When the trachea was opened in rabbits, fowls or pigeons, and pure cultures were inoculated upon the surface of the excoriated mucous membrane, a characteristic pseudo-membrane was formed. At the same time there was a bloody œdema in the vicinity of the wound, hæmorrhagic foci in the neighboring lymphatic glands, and a serous effusion in the pleural cavity.

In a second communication, published in 1887,³ Loeffler reports ten additional cases of diphtheria in which he has found the bacillus under consideration; and also the fact that he has obtained from the same source a very similar micro-organism, which differs mainly from the diphtheria bacillus in being non-pathogenic for guinea pigs. These animals are very susceptible to the pathogenic action of Loeffler's bacillus, and invariably die within two or three days after subcutaneous inoculation with a small quantity of a recent culture. When the vagina of a guinea pig is slightly excoriated and an inoculation made, a diphtheritic inflammation ensues, with the formation of a characteristic false membrane.

Hoffman,⁴ of Vienna, has recently published a paper giving the results of his experimental researches with reference to the bacillus of Klebs and Loeffler. He, also, has found in the false membrane of

³ Centralblatt für Bakteriologie, vol. 2, p. 105.

⁴ Wiener Med. Wochenschrift, Nos. 3 and 4, 1888.

diphtheria a non-pathogenic bacillus which greatly resembles the diphtheria bacillus and he seems to be of the opinion that it is simply a variety of the former. His researches lead him to think that the bacillus of Klebs and Loeffler may differ greatly as to its pathogenic power. His cultures, in certain instances, killed very young guinea pigs when they had not the potency to kill adult animals of the same species. He also observed that old cultures had less virulence than recent ones, and found that animals which survived an inoculation with these old cultures were subsequently immune.

Roux and Yersin, in their paper referred to, give an account of the morphological and physiological characters of the bacillus of Klebs and of Loeffler, corresponding with that of the last mentioned investigator. As a result of their researches and experiments upon the lower animals they feel justified in taking a more positive position with reference to its etiological relation to diphtheria than Loeffler was willing to do. They found it in all their cases, and make the following statement :

“We must recognize that if the work of Loeffler has not resolved the question of the etiology of diphtheria, it has very well prepared the way for the study of this malady. It has served us as a point of departure for the research which we publish to-day, and which permits us to affirm that the bacillus of Klebs and Loeffler is the specific bacillus of diphtheria. In fact, we have found it in all the cases (15) of diphtheria that we have examined; with pure cultures of the bacillus we have, like Loeffler, produced false membranes in animals; but, more fortunate than he was, we have been able to produce in animals paralyzes analogous to those observed in man as a result of diphtheria. Finally we have demonstrated that the cultures of this bacillus contain a poison which, according to the dose injected, rapidly kills animals or induces in them paralyzes in the absence of the living microbes.”—(l. c., p. 631).

In view of the importance of the subject, and the value of this recent experimental research, I shall give a somewhat detailed account of the results obtained by the French bacteriologists mentioned.

To obtain a pure culture from the diphtheritic false membrane they employed a procedure similar to that of Loeffler. With a platinum needle charged with a little bit of the membrane, successive striæ were made upon solidified blood-serum in a series of tubes. These were placed in an incubating oven, at a temperature of 33° C. (91.4° F.) where numerous colonies quickly developed along the tracks of the needle. In those striæ made last the colonies were found to be separated sufficiently to permit them to recognize the specific bacillus, and from such colonies other streak-cultures were made, and in the end

cultures of undoubted purity were obtained. The colonies upon blood-serum are said to present the appearance of little round masses, having a grayish-white color, and of which the centre is more opaque than the periphery. The growth is so rapid that the colonies of the diphtheria bacillus are already apparent before the saprophytic organisms present have commenced to grow.

In their experiments upon animals, Roux and Yersin obtained results corresponding for the most part with those previously reported by Loeffler. In their tracheotomy experiments, however, death was the rule. The affection produced by this method in rabbits is said to have resembled in a striking manner pseudo-membranous croup. The animal respired with difficulty, the trachea was congested and lined with false membrane, and the tissues and lymphatic glands of the neck became swollen and œdematous.

Loeffler found that subcutaneous inoculations were not fatal to rabbits and pigeons. The cultures of Roux and Yersin proved to be more virulent and were commonly fatal to these animals. Pigeons inoculated in the pectoral muscle died in sixty hours, when the dose given was in the neighborhood of 1 cc., but in doses of one-fifth cc. recovery was the rule. Rabbits which received a subcutaneous injection of 2 to 4 cc. died within four or five days, but when the dose was reduced to 1 cc. they survived the inoculation.

Guinea pigs were found to be far more susceptible, and often died within thirty-six hours after the introduction, subcutaneously, of a small quantity of a culture. The lesions found were a more or less extensive gelatinous œdema; general dilatation of the vessels, with congestion of the lymphatic glands and internal organs, especially of the suprarenal capsules; serous effusion into the pleural cavities; and sometimes hepatization of the pulmonary tissue. Pleurisy, which was the rule in guinea pigs, was the exception in rabbits. On the contrary fatty degeneration of the liver was frequent in the rabbit and was not found in the guinea pig.

We remark that there is nothing characteristic of diphtheria in these lesions, and that very similar phenomena are induced by lethal doses of a culture of various pathogenic micro-organisms.

Intra-venous injections were found to be fatal to rabbits—contrary to the results reported by Loeffler. Inoculations into the peritoneal cavity of 1 to 2 cc. of a pure culture caused death at a later date than when the same doses were administered subcutaneously—three to four days. Cultures which had been kept for some time exhibited a less degree of virulence, but they were not attenuated in a permanent manner, and upon renewing them manifested the original degree of virulence. In this respect the results obtained differ from those reported by Hoffmann.

Careful experiments made to ascertain whether the bacillus multiplies in the blood or tissues of inoculated animals gave a negative result, corresponding in this respect with the result reported by Loeffler. Even the exudate into the pleural cavity was found to be free from bacilli, and when injected into other guinea pigs did not produce any perceptible disturbance.

If animals which have received an intra-venous injection are killed at the end of five or six hours, the bacillus may be recovered from the spleen, but at a later period, at the end of sixteen hours or more, they are no longer to be found, either upon direct examination or by cultivation of the spleen *en masse*. Yet these animals succumb at the end of thirty to thirty-six hours, notwithstanding the disappearance of the bacillus from their circulation.

According to Roux and Yersin it is possible to produce false membranes upon the mucous membrane of animals, similar to those of diphtheria, by other microbes than that of diphtheria, and reference is made to the experiments of Talamon,⁵ made in 1881. They therefore lay great stress upon the production of paralyses as a result of non-fatal inoculations with the supposed specific microbe. Loeffler had observed some motor disturbances in his inoculated pigeons, but ascribed them to other causes than the action of the poison present in his cultures. Roux and Yersin, on the contrary, claim to have had very definite positive results in pigeons and in rabbits. The following example is given: A rabbit inoculated in the trachea, after tracheotomy, presented on the second day dyspnoea, with noisy respiration. Later it improved, but on the sixth day it was observed that its posterior extremities were paralyzed. This paralysis was progressive, and the animal died. The lymphatic glands of the neck were found to be swollen and œdematous; the trachea was congested, but no longer contained false membrane.

In rabbits which survive an intra-venous injection paralysis is said to occur quite frequently. Usually it appears first in the posterior extremities and is progressive, within a day or two invading the entire body; again, it may remain limited to the posterior extremities for some time. Pigeons recover from these paralyses more frequently than rabbits. Our authors claim that this evidence completes the resemblance of the experimental malady, produced by inoculations with this bacillus, to the natural malady, and establishes the specific rôle of the bacillus of Klebs and Loeffler.

Without going quite so far as this we may say that the evidence seems to us to give strong support to this conclusion.

⁵ Progrés Medical, 1881, p. 112 and 498.

The presence of a soluble chemical poison in the cultures of the bacillus under consideration is shown by Roux and Yersin in a series of interesting experiments.

When such cultures are passed through a porcelain filter a clear acid fluid is obtained, which is free from micro-organisms. This fluid injected into the peritoneal cavity of guinea pigs or into the veins of a rabbit in large doses—35 cc.—causes death at the end of five or six days. The animal remains apparently well for two or three days; then it ceases to eat, and a bloody discharge occurs from the urethra, it becomes more and more feeble, its respiration is irregular, and finally it dies from exhaustion. At the autopsy the axillary glands are found to be enlarged, all of the vessels are dilated, and especially those of the kidneys and supra-renal capsules; the urine is sometimes bloody, and there are ecchymoses along the vessels; the pleural cavities contain a serous fluid.

In old cultures the toxic substance is said to be more abundant, and death may occur in guinea pigs as a result of the subcutaneous injection of comparatively small doses, the interval being determined by the amount administered. The lesions produced by the subcutaneous injections of a sterile culture are said to be identical with those produced by unfiltered cultures, except that there is no formation of false membrane. The exact nature of the toxic agent in these filtered cultures has not been determined, but it has been shown by experiment that a temperature of 100° C. (212° F.) maintained for ten minutes renders the liquid containing it innocuous, even when injected directly into the veins of a susceptible animal. Finally, I may say that the experimental evidence, with reference to the etiological rôle of Loeffler's diphtheria bacillus, is rather more satisfactory than that which has been adduced in favor of the relation of Eberth's bacillus to typhoid fever, or Koch's "commabacillus" to Asiatic cholera, and that most conservative bacteriologists seem inclined to the view that it is in fact the specific infectious agent in this disease.

AMPUTATION IN CASES OF TRAUMATIC GANGRENE.

BY E. A. LEWIS, M. D.,

Professor of Anatomy in the Long Island College Hospital.

Read before the Brooklyn Surgical Society, December 6, 1888.

The point which I wish to bring up for discussion this evening is not designated in the title of this paper. It needs to be explained at some length. It is the question of the advisability of early amputation in certain cases of traumatic gangrene. The class of cases I refer to

will be illustrated by brief histories, and discussion is invited on the conclusions drawn from the histories given.

I do not wish to enter into a general review of gangrene and its treatment. I am referring to cases of traumatic gangrene only, where obstruction to the circulation of the extremity is caused either by ligation of an artery or such injury as interferes with the vitality of the part—usually the rupture of the principal artery.

Nor is it to *every* case of this class that I refer. The procedure in many, if not most, of the cases of this variety is perfectly clear to the surgeon. There are certain conditions, however, which arise, which seem to me to indicate a departure from the rules laid down in the books of reference.

Surgical authorities seem to be pretty well agreed that immediate amputation is the proper procedure when we are sure that the integrity of the circulation of an extremity is permanently interfered with.

Gross says: "When injury of an important artery, nerve, or joint is the cause of the mortification, amputation can hardly be performed too soon."

Erichsen says: "When the gangrene is local, therefore, we usually amputate at once. This is especially the case when the mortification results from severe injuries or is the result of the wound or ligature of an artery."

"Holmes' System of Surgery," in an article by Mr. Holmes Coote, says: "The indications for immediate amputation are so clear and so generally acknowledged that he who shrinks from the responsibility of the operation stands exposed to just reproof."

The article in Ashhurst, by Prof. P. S. Conner, says, "Amputation should be performed at once."

These brief extracts might be multiplied indefinitely. They are the expressions of opinions found in all of the standard works on surgery. They are, of course, absolutely correct.

I call your attention, however, to a class of cases which seems to be an exception to this rule, cases where a certain amount of delay in operation may save the life of the patient.

In relating the two following cases I shall only detail the history so far as necessary to illustrate my meaning, and these two cases may stand as examples of many others which find their way into our hospitals.

Peter Andersen, seaman, native of Norway, aged 45 years, was admitted to the Long Island College Hospital, February 27th of this year. Five days before, while at sea in a storm, his right arm was caught and crushed by a falling yard. On his arrival in port, he was taken at once to the hospital. The right arm was much swollen; no

fracture discovered. Hand and forearm cold. No pulsation in either artery of the forearm. Brachial could not be felt on account of swelling. Axillary artery pulsated. Ecchymosis extended to the trunk, anteriorly to the abdomen, and posteriorly, on the back, as far as the gluteal region. The skin was unbroken. General condition good. Temperature, $101\frac{1}{2}^{\circ}$.

Consultation determined on delay before operation.

March 3d.—General condition good. Temperature, 103° . Gangrene of hand and forearm developing.

March 8th.—Line of demarkation forming at lower third of forearm. Temperature, 102° . Condition of upper arm better. Less ecchymosis and infiltration.

March 12th.—Some erysipelas of face. Temperature, $101\frac{1}{2}^{\circ}$.

March 15th.—Line of demarkation well formed. Condition of upper arm and general condition of patient seemed to warrant amputation, which was done by Dr. Rand at middle of arm.

Patient did well afterward; was discharged cured, June 6th. From the time of admission, February 27th, to March 15th, the date of the amputation, repeated consultations were held, but at no time between these dates did it seem that he would have a better chance of living with his arm off than with it on. It is unnecessary to state, of course, that the patient was supported by every known means during this interval, that he was isolated, and that proper disinfection was practiced. The record of his daily temperature and the different therapeutic and hygienic measures used are also omitted.

Now, in this case, how could the rule of immediate amputation have been practiced, even if he had been seen immediately after the injury? There was no solution of continuity of bone. The skin was unbroken. It was not entirely clear that the artery was ruptured until lack of circulation developed the fact. If amputation had been done at once, what point was to be selected? How was it possible to tell whether to operate above or below the elbow?

It seems that the only thing to do was to wait. Then the arm became so swollen and infiltrated and ecchymotic that incision would have been sure death. If there were any means of knowing the exact location and extent of the injury, I would surely in such a case, be in favor of applying the rule of immediate operation. Time alone developed this; and when it was clearly shown, then was not the proper moment for amputation. It seemed as if he would surely die with his arm on, and it was sure and immediate death to remove it. In the balance, it seemed that he stood a better chance of surviving the septic fever than of withstanding operation. The result proved the wisdom of the decision.

Michael Collins, longshoreman, native of Ireland, aged 28 years, was admitted to Long Island College Hospital, June 25th, 1888.

A short time before admission an Italian had fired three shots from a revolver at him; one produced a contused wound over the sternum, a second caused a flesh wound of the right natis, the third passed diagonally downward, inward, and backward through the middle of Scarpa's space on the right side. This last wound was the only serious one.

Some hours after admission, an exploratory incision revealed the fact that both the femoral artery and vein were injured by the bullet. Both of these I tied in Scarpa's space; the artery just below Poupart's ligament, with a second ligature below the point of injury; but both of these were above the origin of the profunda. The vein was tied at the lower angle of the space.

After two or three days it became evident that circulation would not be established throughout the leg and foot. The question, as in the last case was, *when* to operate, and *where*? There was no line of demarkation. The leg and thigh were much swollen and infiltrated. An amputation promised speedy death, on account of the great swelling and infiltration, as well as his weakened condition. In this case also, almost daily consultations were held, and no little difference of opinion expressed as to the advisability of operation. The patient was isolated, and received all possible care and supporting treatment.

About July 10—the record omits the exact date—he had a secondary hæmorrhage, which was controlled by Dr. Wight after some difficulty, by four ligatures *en masse*. The exact bleeding-point itself could not be secured.

On July 12th, seventeen days after the operation of ligation, the infiltration had somewhat subsided. General condition was fair; temperature ranged from 101° to 103° . It was about decided to operate. There was no line of demarkation, but the tissues below the knee were dead. On this date he had another secondary hæmorrhage, not from the femoral or external iliac. This fact decided the doubt, and on July 13th, eighteen days after the injury, Dr. Burge amputated at the middle of the thigh.

Patient rallied fairly well and made progress toward recovery, but was attacked by pneumonia, and died on September 10th, two months after his leg was removed.

In this case immediate amputation meant operation at or near the hip-joint. He was a strong man, and it seemed likely that his limb might be saved as low as the knee. For a number of days, circulation promised to establish itself to or below the knee; but probably the obstruction to both the advance and return flow of blood determined

the death of all tissue below the knee. To be sure, this patient did not recover ultimately, but I contend that his life was prolonged and chances of recovery were better on account of the delay in operation; besides, he did not die directly of his wounds. The intercurrent pneumonia in his weakened condition determined the balance against him.

How could operation have been wisely performed sooner? To be sure, he would have been relieved of the sepsis due to the presence of dead tissue; but amputation at or above the knee, in swollen, infiltrated tissue, where every capillary almost requires a ligature, is a matter of last resort.

Any conclusions or inferences drawn are not from the above two cases alone, but from a study of numbers. These two are representative. In the majority the indications are plain; but the cases detailed are types of those that happen, which are exceptions to the established rule.

It seems to me, then, a fair conclusion that there is a certain class of cases of injury to main vessels in the extremities to which the usual surgical rule of immediate amputation is not applicable. These are:

1st. Cases of crushing injury, where the force is so applied that there is no solution of continuity of bone, and where the skin even remains unbroken. In such a case we may be reasonably sure that the main vessel is injured, but still the point of injury is not determined by any outward sign. How can we operate at once in such a case. We do not know but circulation may return in most if not all of the member. If we operate, what point can we select? We are likely to sacrifice a part of an extremity on an uncertainty, and if, on the other hand, we do not go high enough up we are just as badly off as before.

A second class of cases has been illustrated. In this class the main artery, or worse, the main artery and vein both, have been ligated for injury or other reason. Here we *must* wait to see how far collateral circulation will establish itself. When we find that it does not, operation is indicated; but when this has happened the limb may not be in condition to be taken off at once.

Is there *any* definite rule of procedure which can be laid down?

It seems to me not. Every case must be a rule unto itself. When a careful consultation decides that the chances of life are better with the limb off than on, then operate. It may be soon or late as regards the injury. Demarkation may not be waited for, as was the fact in one of the cases quoted, or it may be better to let it be established. The amount of sepsis, the amount of infiltration and swelling in the live tissue to be attacked, the general strength of the patient, will all help to form an opinion.

What I have said does not attack any established rule of surgical practice. That is by no means its object. It seems, though, that such cases as I have mentioned are of frequent occurrence and form a class of cases by themselves; to which attention may be called and an endeavor made to suggest rules of surgical procedure. I am not aware that this is done in any of the standard works on surgery.

DISCUSSION.

Dr. WIGHT.—Will Dr. Lewis allow me to make a correction in the history of the last case. The omission is not due to the reporter, but to the house surgeon.

After the amputation, I do not know how long after, very severe secondary hæmorrhage occurred in that case, and I had in my mind when my turn came to speak, to speak of the manner of arresting it. That hæmorrhage had a great deal to do with the death of the patient, in addition to the pneumonia, and whether it appears in the record I do not know. In order to make this record complete it seems proper to have that in.

Dr. LEWIS.—I will explain to the gentlemen that I was out of town through the last weeks of the life of the patient, and was not able to follow the case perfectly. And that is not in the history.

Dr. WIGHT.—I might as well say here that the method of arresting the hæmorrhage was by suture ligature, taking some large needles and going under the bleeding arteries and tying them. I tied four of them before the blood stopped flowing.

Dr. LEWIS.—The point is, that the books lay down, almost as an inevitable rule, "amputate immediately." Their utterances are very strong on that point, but it seems to me they do not make allowances for a number of cases which are exceptions to this rule, and it is such a class of cases that I wanted to call attention to.

Dr. ROCKWELL.—I think that the majority of authors, certainly those with whom I am familiar, indicate the propriety of waiting until there is an indication of the necessity of amputation. In acute septic gangrene early amputation should be resorted to, lest in the endeavor to save a limb we lose a patient. But in such cases as those reported by Dr. Lewis, I think all authorities agree in waiting for some indication for operation. I certainly should myself.

Dr. WIGHT.—I think I should like to say a word, and perhaps the better way of speaking it would be by relating some experience.

I am well aware, and formerly taught with a good deal of incisiveness, that the rule was, in acute septic gangrene, to resort to amputation. The authorities, with the exception of those mentioned by Dr. Rockwell, are very incisive on that point. So much for that.

A number of years ago, I cannot now recall how many, I had a patient, a girl, who fell down stairs and broke the left forearm near the hand and made a compound fracture of the ulna. In a few days the hand began to mortify and the temperature was up beyond the normal considerably. I could not understand at that time what the cause of the septic condition might be, but I found upon examination that about a week before she fell she had been vaccinated, and that had taken well, and her condition was complicated by the fever of the vaccination. I was well aware of the position of surgeons upon that point, and I called a general consultation, and all my colleagues at that time radically differed from me. They were for amputation at once; but I was obstinate, and, as the patient was mine, they finally conceded to me. I waited for some little time, I don't remember now how long, until a line of demarkation formed, pretty well along the forearm, and I am firmly of the opinion that if I had amputated in that case earlier my patient would have lost more of her limb than she did lose, and perhaps her life.

Another case: A patient, an able-bodied seaman, in the prime of life, had a hawser wound around the left leg at the knee-joint, producing a traumatic aneurism of the popliteal artery. In that case I desired to amputate at once, and consent was not given. That would have been good practice, that would have been according to the rule, even before acute septic gangrene set in. This was after the other case.

My mind was so firmly fixed upon the propriety of amputation that after a few days, when the limb was mortified and only a small portion of the leg left unaffected, I confess I did not act quite wisely, for I yielded to the influence of bringing about an amputation, and I amputated in the middle of the thigh. This made a very great impression upon me, for at that time the thigh was so swollen that my knife would not reach through. I had to press the tissues together in order to get the knife through. The mortification went on with the utmost rapidity, invading the limb above and the trunk, and in about two or three days the man died of acute septic mortification of almost the whole body. It was the most horrible case I ever saw.

Dr. FOWLER.—As I understand it, the question is, in cases of gangrene, the result of traumatism, should the limb be amputated as soon as gangrene makes its appearance, or wait until the classical line of demarkation is formed?

I think a great deal will depend upon the general condition of the patient. If a limb has been crushed, for instance, in a railroad accident, and gangrene makes its appearance early, it is evidently due to the local traumatism to a great extent, and the patient's temperature

progresses by rising each hour, as we sometimes see it. In those cases it seems to me the rational thing to do is to get rid of this centre or focus of infection at as early a stage as possible. If, on the contrary, the septic influence is not great and not increasing (and we know that some patients present greater tolerance of septic infection than others), waiting until some effort has been made to isolate the dead and dying tissues from the living might be indicated. I do not think any hard and fast rule can be formulated for this class of injuries. It has fallen in my way to see a large number of limbs mangled in railroad accidents, and I speak of those particularly because, probably in that class more than in any other, this question will arise. I cannot now formulate any particular rule that I would care to lay down for others to follow, or to follow myself. I think the whole question will turn, as I said before, upon the amount of general infection present or threatened. Certainly it seems rational and reasonable to get rid of this putrefying member, even though the line of demarkation may not be formed. While you may take, by this, some risk, on the other hand, if this mass of putrefactive or putrefying material is allowed to remain, the result will be almost certainly disastrous.

Dr. PILCHER—The reader of the paper and the President have honored us with their opinions as to the advisability of amputation under certain circumstances. I should personally like very much if they would both of them explain a little more in detail the reasons of their opinions. I think that would be likely to bring us to the very pith and marrow of what we want to get at this evening in this discussion. Thus, in the case of the sailor who was brought to the hospital, that has been referred to and described. The condition of the arm is mentioned, the statement is made that it was manifestly improper or impossible to do anything, and yet I have failed to catch the reason why the condition of the limb, as described, made it impossible; what were the conditions that made it improper for any kind of surgical interference to have been made in that particular case. And the same statement was made by the President in his remarks with reference to one of his cases, that, notwithstanding the advice of his colleagues, he himself was of the opinion that it ought not to be touched, and he didn't touch it; but he didn't give the reason why he was of that opinion. I have been hoping that there might be some suggestion made this evening, so that the discussion might take the form of a discussion of principles which may underlie these opinions. I might have some opportunity of engaging in the discussion or get some information for my own future guidance; and I would be glad to put these remarks, after this statement, into the shape of a question: Why, in these particular cases, were the opinions indulged?

Dr. WIGHT.—In regard to that point, I do not know that I stated enough to make it clear. I do not know that I described what was passing in my mind sufficiently well to have it taken hold of. I had the impression that I did, but it seems now that I did not. If you put the subject in this way, it will be a repetition, in part, of what I have already said. I will ask Dr. Lewis to make his statement first.

Dr. LEWIS.—It is in the way of a continuation of your remarks.

Dr. WIGHT.—The principle involved is this: At the onset, with a severe crushing injury or an injury that will lead to acute mortification, and the older surgeons call it septic, the system is in a fairly normal condition, there is no poisoning of the system, there is no special effect upon the blood in the system. Then is the time for amputation if you know where to cut. I think this part is sufficiently clear.

Now then, when gangrene or mortification does come to pass, what do we have? We have the entire system loaded with waste material—I didn't go much further than that. Perhaps we have the whole system flooded with waste material, microbes in the system, the temperature high, and to amputate then would be very much like amputating if the patient had some kind of fever. His general system is in peril, his nervous system is infected with this poison, and he cannot resist it. So, knowing that from a certain amount of experience, we leave it, and do not operate for the time being. He will resist the continued influence of mortification better than he will the effect of the operation. It is a choice between two evils. And by waiting until the line of demarkation is established, his system will stand up against the operation with good success. That is the reason in my mind in regard to it, and the unfortunate result in cases amputated in that secondary stage confirms me.

Dr. ROCKWELL.—In the case which you detailed of the young girl with the fractured arm, had there been any extension of the gangrene?

Dr. WIGHT.—The hand began to swell and look livid. There was no line of demarkation for several days. By and by it did take on the line of demarkation.

Dr. PILCHER.—The President has made clear his judgment in the case; but what is not clear to my mind is, why the fact of there having been the vaccination fever made it necessary for the patient to be exposed to the continued septic infection that was going on in the hand and forearm.

Dr. WIGHT.—That is not the point. The point is, the patient is exposed to this septic infection, and we have to fall back upon experience as well as our judgment; and we find that if we amputate, the septic conditions keep right on up the arm, and while they are in that state, before the time to recover arrives, we know by experience they do not do as well.

I would put it in this shape : Would you, in a case of amputation for expediency, suppose you wanted to amputate for bad condition of the knee-joint, would you wait until your patient recovered from scarlet fever or small-pox ; would you amputate then, or would you wait until the fever had subsided ?

Dr. PILCHER.—It seems to me that there is a vital error existing here somewhere, if it could only be made to appear. And the appeal which our President has just made to experience seems to me to uncover it a little ; for it is doubtless true that experience is, as he has said, that amputation or other surgical interference made in the conditions which he has described, viz., general infiltration and advancing necrosis, is likely to result disastrously. What I wanted to bring out in this discussion is an answer to this question, why they are liable to result disastrously ? and still further, to know whether these causes may not be successfully attacked, and, if so, why an opposite line of practice could not be established ?

Dr. WIGHT.—I don't see any way to overcome that unless you can see where to cut off at first. But as we don't know where, and whether it is necessary even to amputate at all until a certain condition takes place, and when that condition takes place it is too late to amputate, and the fact is that our experience is in favor of that—whether those are the best reasons I leave others to judge. They have seemed sufficient to me.

Dr. LEWIS.—You have touched on what I was about to say. First, there is a certain class of cases where we must wait ; we haven't indications at the moment for an operation ; as, for instance in this second case, where both the femoral artery and the vein were tied. We had to wait to see where to operate, otherwise it meant amputation nearly at the hip-joint ; this is one illustrative case. Another is where the skin is not broken ; you are reasonably certain that there is a rupture of the main vessel, but exactly where it is it is not possible to say. That is the first point—that there are certain cases where we must wait, where early amputation cannot be applied. Now when that happens, and we have waited, and we see there is an indication for an operation, when that indication becomes clear, then is not the time for an operation, because the system is infected by this septic fever, and there is usually a large amount of infiltration, and when that infiltration is going on the gangrene is very likely to establish itself in the stump after amputation and pass right up to the trunk. The point of the paper is this : that the books do not specify such classes of cases and they do not lay down any rules concerning them, and I do not believe there are any rules. It is to call attention to that class of cases that I have detailed these two cases and written what I have about it.

First, there is a class of cases where we must wait, although we know the blood-supply is cut off from the main artery; we have got to wait to see. Then the other class of cases in which we cannot amputate when we have found out—then the question is whether the patient will have a better chance of recovery, of withstanding the septic fever, by amputation or by waiting, and my experience is that there is a better chance of recovery by waiting, as a rule.

Dr. WIGHT.—But the Doctor's question is, when the mortification is impending, why not go on at once?

Dr. LEWIS.—All surgical rules are founded on experience, and experience shows that amputations in those cases do not do well.

Dr. PILCHER.—Yet every once in a while new light enables us to alter our rules and we gain new experience.

Dr. LEWIS.—Is there anything to show that early amputation in such cases is advisable rather than delay?

Dr. PILCHER.—The question running through my mind is, whether in our knowledge of ultimate processes there is any hint as to a better line of proceeding, for certainly, to say that a patient whose system is the battle-field of an overwhelming septic infection from a local septic reservoir, must be left without help from surgical interference to contend with these septic forces in the hope that ultimately the natural power may rally sufficiently to drive back the advancing septic infection and to throw up a barrier against it, and that after this has been accomplished, then only the surgeon can come in and clear up the field, seems to me a humiliating position for a surgeon to take. Is our present knowledge of septic processes such as confirms us in following out such traditional methods of procedure? I am inclined to doubt it.

Dr. WIGHT.—One or two words right there, if you please. Take your patient in just the condition you have pictured him, exactly; now then the question is whether the amputation will add sufficient injury to what there is already there to counterbalance or outweigh the reasons for waiting, as you say.

Dr. PILCHER.—I have no doubt that conditions may have become developed which would make the query that has been put by our President a very pertinent one. The question in my mind is, whether, as surgeons, it is incumbent upon us to wait until those conditions have come in.

Dr. FOWLER.—The case referred to by Dr. Wight was that of a boy who was brought to my service at St. Mary's Hospital. My assistant, in my absence, asked Dr. Wight to see the case. There was a rupture of the anterior tibial artery as a complication of the fracture of the tibia, extending into the knee-joint. I saw the boy on the third or

fourth day after the injury; he was then the subject of general septic infection arising from a gangrenous condition of the limb. It had been advised to wait until the line of demarkation was formed, but the tissues were infected quite up to the capsular ligament; the limb was in the most horrible condition that could be imagined. I amputated the limb as high up as practicable, in the upper third of the thigh, and the boy died of a persistence of his systemic infection in less than thirty-four hours after the amputation. The post-mortem in this case showed that the vessel had been ruptured just below the bifurcation, and a clot had formed; this latter had crept gradually up to the vessel, shutting off all afferent branches, until finally it had located itself in the common iliac, at the time the boy died.

In a second case, that of rupture of the brachial, complicating a fracture of the elbow-joint, bearing in mind that in the first case the clot, irregular in shape, had led to such an unfortunate termination, I cut down upon the vessel at the point of rupture as soon as possible, ligated it, and the arm was saved.

Within six months from that time I was called to see a precisely similar case, a fracture of the humerus with rupture of the vessel. I cut down upon the vessel and tied it above the clot which had already commenced forming at the site of the rupture. This case also terminated favorably. My belief is that these two cases would probably have died, as did the first, and for the same reason, had I not promptly substituted my catgut ligature for the progressively increasing and irregular clot.

In the case which Dr. Wight refers to, I doubt very much that the amputation produced the death of the patient. My belief is that the patient died because he had already so much septic material aboard that he could no longer stagger under it.

There died yesterday, in my service at St. Mary's Hospital, a man who was injured by a railroad car four days previously. He had an extensive lacerated wound of the inner aspect of the knee and leg; and twenty-four hours from that time he was the subject of grangrene of the limb, extending some distance on the thigh, and within twelve hours from that time he was suffering from a general infection. I amputated the limb at once; he died yesterday, on the fourth day, of septic infection, and *not* from the operation.

DR. WIGHT.—Do we understand Dr. Fowler to say that in all these cases he would not delay amputation, setting aside the uncertain stage, but just as soon as mortification declares itself that he would amputate? Take it in a case when you don't know, when no man can know whether there is to be mortification or not, but by and by there comes a time when it begins to mortify. As soon as it begins to mortify do you advise amputation?

Dr. FOWLER.—I believe the question of the patient's condition is the only one to be considered in this connection. If he is suffering from septic infection, the source of that infection should be removed at once. Nobody can tell where or when a line of demarkation will form, but if there is a source of infection, and his tissues are being fed from that source, or, in other words, if he is suffering from systemic infection, I would as certainly consider it my duty to remove that source as I would to dash a poisonous potion from the lips of a child whom I saw drinking it. If the source of the infection is a gangrenous limb, that gangrenous limb should be removed just as soon as I was satisfied that that was the source of his trouble.

Dr. ROCKWELL.—It seems to me this discussion is a little discursive. In my opinion the first of the cases the President has mentioned would have had as good a result by following out the rules which are ordinarily accepted as governing the treatment of such cases. The rule in traumatic gangrene is not to amputate very high up, as you would in spreading gangrene, and therefore an early amputation would have been made at the point finally chosen. The second case that Dr. Wight mentions it seems to me was, by the ordinary rules, a case for early amputation at the knee-joint, and in that case there would have been a chance of rendering the second operation favorable. But where gangrene is well established, I agree entirely with the rule laid down by Dr. Fowler as the one established by surgical clinicians, to which, of course, there are occasional exceptions. The two cases cited by the reader of the paper are certainly such exceptions, and up to the point at which the discussion as to the propriety of amputations came up, no surgeon, no matter how radical his views, would have thought of amputating.

In regard to rupture of arteries, the rule given in the authorities should be carried out, and I can think of no exception except the ability of the patient to bear the operation.

Dr. PILCHER.—I would like to describe a certain case which may illustrate the way in which these theories as to the relations of progressive septic infection to traumatic gangrene may be applied in the treatment of that condition. This is not a case which involves such immense perils as those in which the whole limb is injured, but still I think it may show the principle.

A man is brought into the hospital with a severe contusion of the foot, a heavy stone has fallen upon it. The integument about the toes is lacerated somewhat; the amount of damage which the tissues about the toes have received is somewhat uncertain; it is a bad contusion of the foot. At the end of forty-eight hours the foot is greatly swollen, a livid hue, with blebs, has developed over a portion of the

dorsum of the foot, the inflammatory infiltration is extending up the ankle into the leg, two of the toes have already fallen into gangrene, and high febrile reaction is manifested in the individual. Local gangrene and septic infection are developed, and evidently an advancing necrotic process is going on in the foot.

It seems to me that here is a case where the judgment of the surgeon may fairly be asked as to what ought to be done. The primary conditions have passed, and secondary conditions of gangrene, septic absorption and general constitutional disturbance have been developed. Now shall the surgeon wait and let the battle go on until the full amount of possible damage has been accomplished, a line of demarkation formed, and a plain indication is established as to where the ultimate amputation shall be made, or shall he interfere at once?

I heartily endorse as a working theory the ideas that my greatly respected colleague, Dr. Fowler, has given us this evening, but I want to go further than he does, and say this: That not only in these conditions have we in the gangrenous material a focus of infection which is a source of danger to the individual as long as it remains there, but there has already been established in the debatable ground a half necrotic state where the irritating poisonous products of the microbic invasion are overwhelming the tissues, and the immediately local irritative congestion is putting successive layers of tissue into conditions which make it so extremely difficult for them to resist the advancing septic attack, that they are being progressively thrown over into a state of necrosis. If this is so, it is essential that at once the most radical means of freeing these infiltrated tissues should be adopted, and that the most radical means of removing the already necrotic tissue should be proceeded with.

Therefore, applying this principle to the conditions which I have described, the procedure was as follows: The gangrenous toes were removed, and then into the dorsum of the foot, free, extensive and deep incisions were made, copious antiseptic irrigations were practised, and the gaping wounds were lightly stuffed with bismuth gauze, so as to favor free drainage. Now, mark the result: In twenty-four hours, instead of the condition of threatening gangrene of the whole foot, a condition of well-being was established, the tissues had resumed a healthy appearance, even those tissues which had blebs upon them were more clear of them and had regained their vitality, healing by granulation had become established. From this time on steady recovery was assured.

It seems to me that here is an illustration of what may be done in many cases where greater masses of tissue are involved, although I fully realize the fact that there may be times when we are called so late, the

local conditions have become so aggravated in their development, and the general resisting powers so feeble, that it is possible our interference would be the last straw that would carry the patient off. But if he has not come to that condition it seems to me there is often a possibility at least of applying these principles to the conditions of traumatic gangrene, even before a final definite line of demarkation has been formed.

Dr. WIGHT.—I would like to ask the Doctor if he would advocate amputating in traumatic gangrene before a line of demarkation takes place?

Dr. PILCHER.—I would most certainly; and I wish to say further, that I am strongly inclined to the opinion that the question of the line of demarkation, in cases of traumatic gangrene, is an inheritance from the pre-antiseptic era of surgery; that to permit it to influence our work is not consistent with our present more exact knowledge of the processes involved in these conditions; and that whether we shall amputate or not is determined altogether by other considerations.

Dr. FOWLER.—I would make the amputation as soon as I was convinced that my patient was suffering from infection. My opinion with regard to the propriety of amputating would have nothing to do with the line of demarkation. I think the suggestion is, Is this patient suffering from infection? Then I say, remove whatever is the source of infection, as seems indicated by the patient's condition.

Dr. WIGHT.—Of course this refers to gangrene from injury, not to frost bites or anything of that kind.

Dr. WUNDERLICH.—If there is a source of infection, I would be in favor of removing it as soon as possible. I must say, in my experience, I have found the plan of incisions that has been spoken of, of great service.

Dr. RICHARDSON.—A little child, four years old, had a foot run over by a railroad car, and I adopted in that case the very same treatment that has been referred to, removing the gangrenous toes and making incisions, and by the application of a carbolic solution I was able to save the limb minus the two toes that were crushed; and I firmly believe that if I had allowed the case to go on it would have resulted in mortification of a good portion of the limb. It was a case in which I had Dr. Hutchison in to see the limb in consultation, and that was his suggestion, to remove the gangrenous toes and adopt that method of treatment.

Dr. ROCKWELL.—There is one point in the remarks of Dr. Fowler that I had hoped to hear more fully discussed; and that is, that in many cases of gangrene a low form of arteritis is set up, which precedes to a considerable extent the line of outward manifestations lower down. The only evidence we have of loss of nutrition is at a line

considerably below ; so that, while we are waiting for the line of demarkation to show itself, the tissues are slowly being shut off and strangulated to a higher and higher level. I had recently a case of my own, in which I had an opportunity to watch this process. When the patient first came under my care the question of amputation arose, but owing to her feeble condition it was not possible to perform the operation. While waiting for her to rally, I ligated the femoral with a view of thus cutting off the arteritis ; but in her case, as in those spoken of by Dr. Fowler, the process kept slowly on and on, and at the autopsy a clot was found in the iliac. I believe if I had had an opportunity of amputating, I should have saved the life of the patient. This is the only case in which I have had an opportunity of watching this process, but I believe it occurs more often than we are aware of.

Dr. LEWIS.—This effusion has brought out a discussion rather more voluminous than I had expected. I am of the opinion that the ligation of those arteries that have been spoken of was elegant surgery, and the treatment of that foot was elegant surgery. But I am still farther of the opinion that I expressed in that paper, that there are certain cases which, even if we see them from the beginning, will arrive at a point where, if the patient is not strong enough to resist the septic fever, amputation will not help them, amputation will not better their chance of life. Those cases I have detailed are exceptions to the rule, which do occur, and they occur with sufficient frequency to be noted.

AN ANALYSIS OF ONE HUNDRED CASES OF ANÆMIA.

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Read before the Medical Society of the County of Kings, December 20th, 1888.

An analysis of one hundred cases of anæmia has been made upon the following considerations :

- I. A certain classification.
- II. The causation.
- III. The mode of onset.
- IV. The prevalence of certain common symptoms and signs.
- V. The urinary examination.
- VI. Certain manifestations which, in part, are regarded as neuroses, involving more particularly peculiar vascular changes, and of these more especially the conditions revealed by an examination of the thoracic cavity.

VII. The relation to, and the effects of, constitutional conditions, including the important question, as to whether anæmia is a safeguard against more serious and primary organic disease, or whether it will predispose to such disease.

1. The foundation upon which the classification of these cases has been made, the classification and the basis upon which their consequent analysis has depended, is the hypothesis, that anæmia, in and of itself, is a special disease, and that there is a wide difference between anæmia the disease and the so-called anæmic state, which is always a resultant and is never primary, and that the term "anæmic," which is so commonly applied to patients convalescent from various diseases, and is meant to imply that the patient has "anæmia," in reality describes a condition, wholly unlike and entirely separate from the disease anæmia. Anæmia is rare in infancy and childhood, early and late. Nor is it easy to find the disease in children near puberty, whose growth has been rapid and who suffer from general weakness. Its absence was also observed in advanced life, the greatest age in any one of these cases being fifty-one years, which case, in this respect, stood quite alone, as the patient next in point of years numbered thirty-eight.

Anæmia is considered in the text-books as one of various sequelæ of acute diseases. A series of investigations has failed to make the condition of patients, convalescent from some acute disease, correspond with that of any of the cases now under consideration.

During the month of August of the present year, in the medical wards of St. Peter's Hospital, in the service of my chief, Dr. Clark, I examined all convalescent patients, conducting the examination not on the basis of past disease, but simply on present conditions. There was no convalescent patient whom I could say had anæmia. Some of these patients, who had been watched during their illness in the hospital, have been, since their discharge, under my care at the City Dispensary, and as yet no case has developed anæmia. The reason of this somewhat narrow and limited classification is, that anæmia has been regarded in origin as a purely nervous disease, in which the vital force of the patient is in nowise affected. In his work on the Action of Medicine, in describing the use of stimulants, Headland points out the necessity of not confounding nervous force with vital force, and shows that, while the manifestation of vital energy may be subdued by the want of nervous action, yet the two forces are entirely different. If we watch a case of acute disease, accompanied by a high temperature, the condition which gives us the most anxiety is the strength of the patient, and our endeavor is to maintain that. Whatever theory we may accept as to the causation of the fever, we know that vital

energy must be weakened by the process of the changes that take place. The strength of the febrile condition is increased nervous activity. During this period vital force is weakened, as is shown by the dangerous collapse which often comes on upon subsidence of the fever. If the patient rallies, he becomes convalescent, and by that we mean that health and strength are being recovered. It may take weeks before this is accomplished, but surely this patient cannot be said to be suffering from anæmia, for in him there is merely general weakness, and an absence of special symptoms. Patients suffering from one of the malarial fevers—the disease or its effects—are often said to have anæmia. This condition we would rather regard as due to weakened vital energy, resulting from the malarial poison, and not in itself a special state. Vitality in these fevers must be diminished. An elaborate contribution on these fevers was published two years ago by Joseph Jones of New Orleans, who then pointed out that there were six distinct micro-organisms which he had observed in the blood of patients suffering from malarial fever, and that curative agents act as poisons on these micro-organisms, exciting and producing changes, chiefly eliminative, in the blood. From these observations it is easy to see that both the primary and ultimate changes in the blood are brought about by agents working on antagonistic principles, and, again, that the living matter of the blood itself must be affected, resulting in affection of vital force. Malarial patients therefore have not been considered as suffering from anæmia. Many of these patients are of pale countenance. It may be observed that pallor does not constitute anæmia.

Regarding anæmia as a special disease, an objection would be made to the term “cardiac anæmia” as signifying a complication of primary organic cardiac disease. It would mean merely diminished bodily power, *i. e.*, diminished vital action, resulting from the enfeebled and diseased organ. The same statement may be made relative to pulmonary tuberculosis. The intense drain which goes on in the body, resulting from “the irritation which bacillary changes produce in the lung,” leading in many instances to a general infection or to amyloid disease, is in itself sufficient to account for the general exhaustion, without anæmia being present. One more disease may be added to this list of explanations—this is chorea, the ætiology and pathology of which are obscure. Two conditions have been commonly regarded as having some connection with its causation: anæmia and heart disease. In connection with some thirty cases this interesting fact has been observed, which is in keeping with the statements which have been made above: More than one-half of the cases resulted from a rheumatic manifestation, varying in degree from erythema

nodosum to rheumatic fever, in which there was cardiac change, resulting in diminished vitality. The remaining cases presented an excellent general condition, and in none could I say that the disease anæmia was present.

The diseases here enumerated would be taken as types of all conditions, where severity of abnormal states would tend to weaken and debilitate, leaving vital energy more or less diminished.

These few considerations have been set forth as explanatory of the classification which has been made of these cases. The term anæmia, defined by the anatomical characters of the blood, resulting from changes which it undergoes, would cover a larger number of abnormal conditions than here has been ascribed to it. J. Mitchell Bruce has noted three changes: Oligæmia, aglobulism, hypalbuminosis. These conditions can be produced by sudden and severe drain, the loss of blood, or by destruction of blood corpuscles, as was noted when speaking of the malarial fevers. All of these would be resultants, while, in the classification which here has been made, the term anæmia has been regarded as applying more particularly to a primary disease with special manifestations. In a large number of cases an examination of the blood would reveal nothing abnormal or changes so slight in anatomical character as to be practically unimportant.

An examination of the blood in the cases tested showed a diminution of red corpuscles, but no evidence of destructive change.

It is possible that an absorption of the fluid constituents takes place as the disease progresses.

Had it been strictly scientific, no classification relative to different forms of the disease would have been made, and those which have been separated would have been regarded as cases in which the disease was present in an intensified form. But some cases, forming a separate class, presented special local conditions, resulting from abnormal tissue change; a few others, certain general conditions. To these the disease anæmia was closely related. Its peculiar symptoms and signs were in all cases first noted. But the local and general conditions followed the disease, and then were accompanied by it. I have therefore thought that these conditions might present themselves during the progress of anæmia, especially in cases in which there was great nervous disturbance. We have therefore for our basis the disease anæmia:

- I. Anæmia (as a special disease).
- II. Anæmia (with special manifestations resulting from tissue change).
 1. Gastric ulcer.
 2. Graves' disease, or exophthalmic goitre.
 3. Chronic inflammatory conditions of the upper respiratory tract.

No case belonging to classification No. II, is included in the one hundred cases now being analyzed. They form a separate division, and are not to be mentioned here at any length. The special manifestations found in gastric ulcer were:

1. Pain—more or less constant in epigastric region.
2. Pain—increased after ingestion of food.
3. Tenderness in epigastrium.
4. Occasional epigastric pulsation.
5. Hæmatemesis.

Anæmia may bear a close relation to the four associated phenomena of Graves' disease.

The changes in the upper respiratory tract were mainly in the pharynx, naso-pharynx, oro-pharynx, and nasal fossæ.

The vast majority of the first class were in young unmarried females, running in age from 17 years up to 38 years, with the exception mentioned above of 51 years. Ten cases taken at random show these numbers: 38, 18, 17, 16, 21, 19, 20, 27, 34, 20. The cases have been taken from all classes of society. Those who followed some occupation were mostly engaged in work which required but little muscular exercise. The majority of these cases were without grave antecedent disease, dating back for a period of several years, with the exception that some had suffered for one or two winters from winter cough, a mild attack of bronchial catarrh, lasting for a longer or a shorter period of time, but never continuing into the warmer months. When first seen the patients had been suffering from two weeks to six months. Some of those that have been placed in the second class dated the commencement of their illness back as far as one year. During this period they had been without treatment, or at least without continuous treatment. The conditions that result from anæmia were present in them before the special abnormal states were found. This fact strongly supports the statement made above, concerning the relation which the disease anæmia bears to these abnormal conditions, and suggests that prompt treatment, continuous and persistent, might prevent these conditions from arising.

II. The Causation.—It is quite impossible, from a consideration of these cases, to say that any particular temperament prevailed in any large number, or to draw conclusions, other than very general ones, and say that under such and such conditions, in individuals representing such and such types, anæmia is likely to be developed. The number of cases is sufficiently large to bring out very strikingly any such predisposing cause, were it present. Opportunities have been given to study race as well as individual peculiarities, and to observe, by questioning the patients' friends, as to the general condition before the

disease made its appearance, if a number of cases, fairly large, could be set aside as representing one form of temperament. It was impossible to do this.

The environments had but little influence in causing the disease.

Two conditions were observed in connection with the cases :

- I. Errors in diet.
- II. Irregularities of living.

These have been considered, therefore, as influential in the causation of the disease. A careful examination showed that in certain cases they were present some time before the patient felt unwell. In others they could be traced back for only a few months before the commencement of the disease. When speaking of errors in diet, I wouldn't have the inference drawn that in any one of the cases there was lack of food. It was, to use the classic phrase, a condition of "food sufficient, but food improper." The number of meals taken in the four and twenty hours was three or four. But fault was almost invariably to be found, either with the time of eating or the kind of food eaten. In no case was there a history of overindulgence in alcoholics. One-half the cases showed that there was lack of nitrogenous food. No greater error in diet was found than excessive and improper tea drinking. Were tea prepared in a proper manner, its use would not be so objectionable. The solutions which are usually made are the result of long infusion, giving a solution of tannin in which neither the volatile oil, the theine, nor the gluten are obtained. The effects of such solutions are most pernicious. When arranging a diet for the patients, tea drinking was prohibited in some and restricted in others. Those who followed the directions given made more rapid progress toward recovery than those who still continued the use of tea. These latter improved more when finally they ceased tea drinking.

Under the second cause would be included :

Want of sleep.

Lack of out-door exercise.

Constant mental excitement.

Constant mental worry.

Improper ventilation in working, sleeping or living apartments.

Recently, Sir Andrew Clark, following in the conclusions of the French school of medicine of many years ago, has stated that constipation is the cause of anæmia, such a condition giving rise to the absorption of poisonous matters. In this theory there are two factors :

1. Constipation.
2. Blood poisoning.

To the first there would seem to be two objections: 1. The condition was present in only a certain proportion of these one hundred cases. 2. A vast number of men and women suffer from habitual constipation in whom there is no evidence of anæmia.

Blood poisoning I would consider a most important factor. From the most recent work on ptomaines and leucomaines, that of Vaughan and Novy, I quote the following words: "Animal alkaloids are formed in the body; they are contained in the excretions; any disturbance between the rate of their formation and their excretion is followed by a corresponding disturbance of health." To this it may be added that, while the excretion of waste products may go on as in normal conditions, from certain causes a greater amount may be formed than can be thrown off. I have found urea diminished in anæmia. It is true that the importance of this is diminished by the fact that one-half of the cases suffered from lack of nitrogenous food, but still in fifty per cent. of the cases such an explanation will not answer. The ultimate products of disintegration may never be formed. Nervous disturbance of any of the organs concerned in digestion will interfere with proper performance of function. From the study of these cases, there has seemed to me no more important factor in the causation of the disease than irregularities in manner of living, whether it be in the society girl whose night is turned into day, or in the factory girl who works at labor, light or laborious, for untold hours.

The steps in the development of the disease are these: irregularities in manner of living, combined with errors in diet, causing unequal distribution of nerve force, the development of ptomaines and leucomaines in poisonous amounts, the absorption of the poison, and the dilution of the blood.

III. and IV. The Mode of Onset, and the Prevalence of certain Symptoms and Signs.—The mode of onset was in all cases gradual; by that I mean there was no sudden prostration, and not that in all cases it required a long period of time, by slow processes, for the disease to manifest itself. The most interesting cases were those in which vascular disturbances were present. In some cases these conditions were developed early in the attack, and the duration of the disease was not longer than six weeks. Here symptom after symptom followed in rapid succession. In other cases, lasting much longer, the vascular changes were not present until later. Dyspnœa upon exertion, was, in some cases, first noticed. It was often, when first seen, the chief complaint. There were only a few cases in which there was nocturnal dyspnœa. There was no case of orthopnœa. Headache was present in a small number of cases. It was never a severe symptom, and never the first manifestation of the disease. These few cases did not give an opportunity to

study the region or the character of the pain. Amenorrhœa was present in one-third of the cases occurring in females under twenty-five. I could trace no connection between the cardiac conditions and the amenorrhœa. Many of the patients were brought by parents or friends for this condition; but in every case it was ascertained that the suppression of the catamenia did not mark the commencement of the disease. In one-half of the cases, pain in the back was first complained of. Muscular pains, general and local, were present in many cases. A flabbiness of the muscles was often noticed by the patients. A few cases commenced with swelling of the feet. Constipation could not be put down as a constant symptom. It was present in one-half of the cases. All of the males suffered from stomach troubles. In only one-half of the females were these conditions present. Stomachic irritation was always more severe in the males. Pyrosis was noticed in a few cases; in no case was it found in the male. Sleeplessness was never observed. Some patients felt languid. Loss of appetite commenced the disease in one-tenth of the cases. It was a variable symptom and found in forty per cent. of the cases. Those who complained of gastric irritation had, as a rule, good appetites. Loss of flesh was a rare occurrence. It was present in only a very few cases. Some change in the complexion was noticed in three-fourths of the cases. A pale line along the gums was observed in patients with indigestion. Hysterical manifestations, such as hoarseness and aphonia were present in a few cases. Neuralgic conditions were seldom found. There were no cases in which morbid conditions of the appetite were present. Vertigo was a late symptom. It was seldom severe, though often present.

We have, therefore, for the first manifestations of the disease seven conditions:

1. Dyspnœa.
2. Cardiac palpitation.
3. Venous and arterial pulsations.
4. Œdema.
5. Muscular pains.
6. Muscular flabbiness.
7. Disorders of digestion.

V. Urinary Examination.—The urinary examination showed: pale color; low specific gravity; an occasional phosphatic deposit, and diminution of urea.

VI. Vascular Conditions.—There are certain manifestations which, in part, are regarded as neuroses, involving more particularly peculiar vascular changes, and of these more especially the conditions revealed

by an examination of the thoracic cavity. Various cardiac signs are due to certain changes that take place in the cardiac muscle. In the consideration of these cases palpitation has been regarded as neurotic, taking for a definition of neuroses that which Strümpell has given in his article on epilepsy: Functional disturbances for which no constant objective lesion of the nervous system can be discovered as the basis. When speaking of the mode of origin, it was noted that some patients complained mostly of cardiac palpitation. But when an examination of the heart was made, as a rule, in such cases, nothing abnormal was found. It must be remembered that reference is made here to only those cases in which cardiac palpitation was the chief complaint. When the percentage of cases is given, it will be observed that many of them had palpitation from time to time, but, with a few exceptions, it was never the chief complaint. Dyspnœa upon exertion was much more common in such patients. A certain number of the one hundred cases have been called cardiac, having no reference in using this classification to cardiac disease the result of acute or chronic inflammation. In such cases care was taken to ascertain the exact commencement of the disease. It was found in the majority of the cases that these vascular conditions were late in developing. But this fact in no wise makes it impossible, as certain other cases proved, the minority, it is true, that the conditions might be present from the beginning, and yet the disease last only six weeks. An examination of the chest was made from time to time, during the continuance of the treatment, noting in this way changes that occurred, observing especially if any case, in which there was no cardiac disturbance on the first examination, afterward developed it. It was interesting to observe the changes. The histories show that two cases, which did badly under treatment, developed the vascular disturbances, after the lapse of, in one case, four weeks, and in the other, eight weeks. As a rule, the cardiac cases did as well under treatment as those in which the special conditions were absent. The course of the disease was no longer. It was not more severe. With a single exception, the cases were found in females of ages running from eighteen to twenty-five years. There were a few older than the age last mentioned. The vascular conditions gave a much more interesting and a greater number of signs than they did symptoms. The number of these cases was 36, more than one-third of the 100 cases. Murmurs were heard in 31 cases. The murmurs were systolic. In 6 cases there was a general systolic murmur, heard without reference to vascular area; in other words, a basic as well as apical murmur. In 19 cases there was a pulmonary systolic murmur heard over the pulmonary area, running down into the general cardiac area for a variable distance. In 6 cases there were both aortic

and pulmonary murmurs. With two exceptions the murmur was loudest on left side. There was no case that gave an aortic murmur alone. In 7 cases the murmur was heard over the back, running up and down the spine. In 5 cases it was heard at the scapular angle on the left side; in 3 cases on the right side. In no case was there continuous transmission to the back, as frequently occurs in apical systolic murmurs resulting from inflammatory processes. In 20 there was increase in the area of cardiac dullness. The normal basic line of the triangular dullness was increased. The enlarged area was both in the direction of the long axis of the heart, and in its transverse measurement. The upper dullness was variable. In every case the dullness to the left exceeded that to the right of the left parasternal line; two inches was the maximum increase to the right of the left parasternal lines; three and one-half inches the maximum to the left of the normal apex line. This was obtained in only a few cases. Palpation of the heart gave a wide diversity of results. In the majority of cases the apex could be clearly distinguished. It was well defined. But in no case was there the distinct and powerful heave which comes from left ventricular hypertrophy; nor was there the diffuse heaving impulse present in cardiac dilatation resulting from inflammation. In only a few cases was there a thrill. I could detect no relation between a heart with excited action and a thrill. In 25 cases the *bruit de diable* was present. This was usually a loud rushing sound, varying in quality. Subclavian murmurs were heard in a few cases. But, as investigation proved that such murmurs could be developed in almost any chest by position, or by pressure of the stethoscope, no attention was afterward paid to them. The French writers on cardiac diseases have used a long nomenclature in describing the peculiarities of heart murmurs. It is quite impossible to trace and give to heart murmurs the names they have used. The most interesting of all murmurs is the musical murmur, which is probably due to a fragment of lymph floating in the blood current. Should we divide murmurs into musical and non-musical, those present in anæmia would come under the second class. I have found it usually to be: a soft blowing murmur; in point of time systolic; never taking the place of the valvular sounds; most frequently a continuous murmur, occupying the whole of cardiac action; intervals between the cardiac sounds and the murmur being rare; made more intense by exertion; not always disappearing when in the recumbent position. From the pulse present in these conditions I could learn nothing. I was able to disprove the statement which is commonly made that the radial pulse ceases when the arm is raised in cases such as I have described.

In these cardiac cases palpitation was frequently never present, it was never severe; it was never the chief complaint.

The various parts of the circulatory system are closely related. Alteration of normal conditions result in abnormal sounds. In anæmia nerve enervation acts as a secondary cause. To develop these murmurs, as indeed all murmurs, there must be, as Chaveau has pointed out, sonorous fluid veins; the vibrations induced by eddies in the blood column itself. According to Dr. Gee, a jet of blood flowing swiftly out of a narrow orifice into a wider space is called a fluid vein. Chaveau has thus explained the *bruit de diable*: The internal jugular vein is adherent, at its lower end, to the cervical fascia, in such a manner that when the venous system shrinks in capacity and adapts itself to a lessened bulk of blood, that part of the vein spoken of cannot shrink and so becomes relatively dilated; hence a sonorous fluid vein, and so the bruit. In the heart itself a temporary dilatation will produce a fluid vein, and so the murmur, as these cases have shown. The examinations have not proved Naunyn's theory that all of these murmurs are auricular. The character of the valvular sounds has prevented the acceptance of the theory. A relative dilatation of the pulmonary artery may explain the basic murmur. The conditions favorable for the production of a fluid vein may result from a change in the position of the artery. A post-mortem examination in a case of anæmia is difficult to obtain, but as patients, as mentioned above, frequently complain of a condition of muscular flabbiness, there is no reason why the tissue of the heart, which is a mass of muscular layers, should not be in a weakened condition, and I see no reason why a relative dilatation could not come from loss of one or more of these layers, giving an enlarged cavity from loss of muscular substance, and having no relation to the enormous dilatation of aortic regurgitation, resulting from over-distension, and bearing no relation to the apical systolic murmur of extreme degeneration in adynamic disease, the presence of which probably foreshadows a fatal issue.

It is not necessary to give the history of any one of these cases. The considerations advanced are from the analysis of the cases.

It should, however, be observed that, in order to determine the precise meaning of the murmurs, other conditions than their presence are most important. To say that the patient has anæmia, symptoms are of as much value as signs. This is especially true in those cases in which the vascular disturbance is the first manifestation of the disease. On the fifteenth day of June of the present year, a young lad was examined, who had but one complaint—shortness of breath. There had been no previous disease calling for medical attention, although a few months before he had had pains in his limbs and

joints. The examination found a systolic murmur at the apex; limited; not transmitted. There was no right ventricular hypertrophy; no accentuation of the pulmonary sound. The absence of this latter, which invariably marks the amount of mitral regurgitation from acute or chronic inflammatory processes, and is of more value than the murmur itself, seemed to point to non-inflammatory conditions. But there was the doubtful history. The diagnosis was not then made. Subsequent examinations showed enlargement of the right heart and its attending conditions. Symptoms of cardiac disease, the result of inflammation, supervened, and the organ is now imperfect.

VII. Relation to Constitutional Conditions.—In the analysis, of these cases, anæmia has been regarded as a primary disease. In the classification which has been made three special conditions were mentioned which might be regarded as complications, although they bear a close relation to, and perhaps are a part of the disease. Putting these aside for the moment, a question arises as to the relation which anæmia bears to the general condition of the patient. Is it likely, that the patient will develop more serious disease, or is anæmia ever the forerunner of such disease? The answer to this question, as given here, rests solely upon the history of these one hundred cases. The conclusion has been drawn that the resisting force—the vitality of the patient—against disease is not diminished. In none of these cases did the various manifestations which have been mentioned predicate the commencement of a sthenic or asthenic disease, acute or chronic.

The analysis of these one hundred cases has been made upon the various manifestations of the different histories presented by the cases. Nine conclusions have been drawn, mentioned in part above. These are :

1. Anæmia is a special disease.
2. It is nervous in origin, blood poisoning resulting.
3. It occurs most frequently in young unmarried females.
4. It is more severe when present in males.
5. The majority of the patients are without grave antecedent disease.
6. When treated it lasts from six weeks to six months.
7. It is not succeeded by acute or chronic diseases.
8. Under certain conditions it may develop abnormal structural tissue change.
9. It responds well to treatment.

DISCUSSION.

Dr. STUART.—I have been very much interested and instructed by the very able paper of Dr. Conkling. I can hardly say that I rise to do other than to express my gratification that I have had the opportunity of listening to the results of the study of such a large number of cases that have been so carefully observed and so fully recorded.

I think the impression made by listening to this paper would be that it is of very great value to the practitioner to keep records of his cases, and then, when a sufficient number have accumulated under a given head, or if in the course of his clinical experience they seem naturally to group themselves under a general head, that it is extremely profitable for himself and still more profitable for him to bring the result of his observations and reflections upon such a grouping of cases before such a Society as this. Individual cases will illustrate principles, but we cannot deduce principles from individual cases. It is only by the assembly of a large number of cases and then by a careful examination of them as to their points of resemblance as well as to their points of difference, that we can derive that general knowledge of the course of disease and the result of treatment of a class of cases, that we are so much in need of, for our guidance in our every-day practice.

I am sure that we all recognize in the selection of the points of view for these one hundred cases, the cases that we perhaps most frequently meet in our offices, perhaps also in the homes we visit, but more frequently in our offices. The patients themselves do not come with any definite group of symptoms; they have not been sick; they are complaining; they are out of health: they are below par; they cannot say that they have this or that, or that they have been exposed to this or that influence, nor do they see why they should not be just as they have ever been. But they are conscious of their inability to perform their usual labors; they are conscious of the loss of enjoyment of life; they are sensible that there is something wrong, and many of them come with the feeling that something is seriously wrong, and their friends who accompany them are impressed in the same way. If as the result of a study of such a large number of cases, as has been brought so interestingly before us to-night, we are led to carefully go over these cases, stimulated by the Doctor's example, in careful study of their various symptoms and go back to their origin, we can justly assure the patients that they have no dangerous or serious disease, and then, predicated upon the experience of treatment, that we can relieve them, we take the first step, and it is one of the very greatest pleasures of our life, in just those cases which are the most rewarding of all.

The patients are certainly miserable in their own feelings, but they do not give us the anxiety that many of our severer cases do.

I should have been very much interested, and I am sure that others would have been, if the Doctor had followed the presentation of the analysis of these one hundred cases, with a grouping of his mode of treatment of them. That would have been a natural sequel to the presentation of the analysis. I think it might perhaps give us another paper from the Doctor's pen, which would be of equal interest.

Dr. RAYMOND.—I would like to ask, Mr. President, whether Dr. Conkling could not, in a word, give us an idea of what his treatment has been in these cases.

CHAIR.—The Doctor can do that later on when he closes the discussion.

Dr. WALKER.—I take it that it is because the gentlemen present fully agree with the paper that there is very little to be said in contradiction of anything Dr. Conkling has said. I believe that it is his first paper before the Society, and it is a paper that he may feel proud of. This paper shows upon its face thought and research. It is a very difficult thing to make a good analysis of a large number of cases. To my mind Dr. Conkling has done wisely in attempting it, instead of detailing cases. We can all listen to a well arranged analysis of cases, but many cases brought before us with an array of symptoms, etc., which we cannot grasp, soon tire us, and I believe such papers tend to keep some of our members away from our meetings. But a paper of this nature will do nothing of the kind. While we appreciate the slight ailments of life, we do not in lectures, or do not in our writing, certainly dwell much upon them. Yet I know of no book that is more valuable than that of Lionel Beale upon "Slight Ailments," simply because it treats of things which other books do not. Its teachings are in line with those brought out in Dr. Conkling's paper, which is simply one of those papers which strikes us as first-rate, which does not admit of much discussion, but which shows much careful study and observation, and furnishes food for reflection.

Dr. P. H. KRETZSCHMAR.—If I should follow in the same strain as Dr. Stuart and Dr. Walker, Dr. Conkling might become so proud that he would not favor us with another paper, and that would be a loss to the Society. I beg to differ with some of Dr. Conkling's conclusions, and more especially with that part to which Dr. Walker referred anæmia, calling it one of the slight ailments of mankind. Referring more especially to the conclusion to which Dr. Conkling arrived, that anæmia does not predispose to more serious illness, I beg to differ with him in that respect, more especially in regard to its disposition to the development of pulmonary consumption. I believe—not only

believe, but I know—that from considerable experience of my own and others, I have seen a large number of cases where simple anæmia was present in young women at the age stated by the Doctor, and was followed by the development of either florid or chronic phthisis. And I believe it is a mistake to bring about the impression that anæmia is one of the slight ailments of humanity. I do not agree with the Doctor's statement, that these cases are always curable within six weeks or latest six months. I remember one case of pernicious anæmia that died under my hands; and it was not under my care alone, but I had the advice of some of my most skilful friends.

As I said before, I refer more especially to the danger of developing pulmonary consumption in cases of anæmia, and I have to contradict and to differ with Dr Conkling as to the question of diminished vital powers in patients suffering from anæmia. He says that anæmia does not diminish the vital powers, and at the same time he tells us that it makes the muscular system flabby and probably absorbs a portion of the heart muscle. I cannot see how it is consistent to say that it does not interfere with the strength of the patient generally, and at the same time admit that it does interfere with the most vital organ of them all—the heart. The exposure of anæmic patients to the contagion of bacillary phthisis, I believe is a very serious question, and it is for this reason, among others, that I object strongly to sending anæmic patients to health resorts that are frequented by phthisical patients, and *vice versa*. If you go to Lakewood or to some of the Adirondack health resorts, you will find anæmic and phthisical patients playing, walking, dancing, and eating together, and when you come finally to analyze the onset of a case of pulmonary consumption, you can frequently trace it to imprudences of exposure to contagion, such as I have mentioned. It is my opinion that Dr. Conkling's statement regarding the effect of anæmia upon the general system is contradicted by the clinical experience of most of us.

Dr. BURGE.—Mr. President, I should like to know in what category in his analysis Dr. Conkling would place those cases that we distinctly class under the head of chlorosis.

Dr. CONKLING.—First, in regard to the treatment of the cases. It was not mentioned in my paper for the reason that it could not be classed under the head of analysis, and because certain experiments now being made are not yet completed. The most important factor to remember in the treatment of these cases is that the condition is *not one of debility*, and that no mere tonic treatment will cure the case. Cases of debility from exhaustion or cases of neurasthenia, if given ordinary preparations of iron, will recover. No case of anæmia, as a special disease, such as I have described in the classification, will recover

with iron alone. It will improve to a certain extent and then stand still. It is possible to demonstrate again and again in dispensary practice in cases which are hurriedly gone over, the term anæmia applied to them, and some preparation of iron given them—that they do not get well.

First and foremost, remembering one of the causes I mentioned, under the head of Irregularities in Manner of Living, it is important to correct whatever may be wrong. And in so far as that correction is perfect, in just so far will the patient make rapid progress toward recovery. Special symptoms sometimes require special treatment, but it is very surprising how quickly these subside and pass away when the great rule, which regulates all treatment, has been thoroughly carried out. And this rule is nothing more or less than regulations founded upon common-sense principles given by the physician to the patient. With that, and with certain drugs, to be mentioned presently, cases of anæmia could be treated without preparations of iron. In these cases, iron in some form has been used part of the time, but in no one of these cases has the term anæmia been considered synonymous with the term iron; they have not gone hand in hand. And many and many a case which has been treated has had the iron relegated to a secondary position, and sometimes used only very late in the disease. But when iron is used, upon the principle of reconstruction and restoration, one principle must be remembered, that with that reconstruction and restoration, depletion should go hand in hand. It is almost impossible in a case of anæmia, in examining the blood, to find what are commonly called conditions where the hæmoglobin of the blood has been diminished in very large amount. The cases of anæmia as a special disease, such as I have described, present a condition of plethora, which differ wholly and entirely from those weak anæmic conditions in which the blood corpuscles are diminished in their number, which, with a diminution in the amount of the red blood coloring matter, is the chief characteristic.

If we remember, then, that depletion must go hand in hand with reconstruction and restoration, the iron that is used will be merely secondary.

Of the immense number of preparations of iron, only three have been used, and they are the oldest ones, namely: tincture of the chloride, carbonate of iron, and the reduced iron.

Then also mercury, arsenic and strychnia have been found to act very well upon the slight changes in the blood, and have been given in a great many cases. Remembering the principle of depletion, every avenue of excretion must be active. Most of the patients in these cases have been instructed to take once or twice a week a warm bath, and in a great number of cases, especially in the latter ones, the main

dependence in treatment has been some saline. It is an old remedy, as old as the hills, which probably originated in the treatment of gout. Every morning a teaspoonful of some saline, preferably Rochelle salts, in sufficient water to thoroughly dissolve it and make a solution. This will correct any sluggishness which may exist in the intestinal canal, but it does not act like a laxative.

But first and foremost is the necessity of correcting irregularities in manner of living, giving the patients everything in surroundings which will enable them to live a proper life; give a saline in the morning, and proper food, especially meat, and they will make a good recovery, aided perhaps with a preparation of iron.

The two methods of treatment being experimented with are: First, inhalation of oxygen gas, which acts purely and simply as an antiseptic to destroy whatever there may be in the blood, especially in the circulation of the right heart which is primarily affected by the leucomaines and ptomaines. Many gallons of the gas a day can be taken after a little practice. The second method, as observed by Mori of Germany, is the hypodermic injection of a mild preparation of iron, which, it will be seen, will act merely secondary to the other treatment. It will also be seen that the number of cases collected by this method of treatment must be very limited.

It has been said that the anæmic conditions were predisposing to pulmonary phthisis. I would most heartily agree with that statement, and I believe that *anæmic patients* are very apt to have, from weakened vital forces, certain general conditions in their system which will predispose to pulmonary tuberculosis. I did not say that the vital force of the patient in anæmia was not diminished. I said distinctly that in origin, cases of anæmia were nervous, and that in that origin, the first step, the vital force was not diminished, but the disease which commences as a nervous disease goes on, and from that weakness results. But notwithstanding that, I am confident that such cases as I have described do not predispose to pulmonary tuberculosis. One strong reason for that conclusion is that many of the cases have been watched for nearly one year, in a large consumptive hospital, and there was an opportunity to trace them after they were discharged as cured, and no acute or chronic disease occurred. But in conditions of disability or exhaustion from a drain of any kind, pulmonary tuberculosis is very apt to occur.

In the preliminary part of the paper, a distinction was made between "*anæmic*" and "*anemia*." The former is a resultant, the latter is a primary disease. A drain of any kind, sudden and severe, will give rise to neurasthenic conditions. But this disease, anæmia, comes from absorption of a poison. In it the blood is charged with waste

products. These one hundred cases had *anæmia* and were not *anæmic*. Cases predisposed to disease are in an anæmic condition, but have not anæmia.

The next question was made relative to those cases termed chlorotic. I did not see, in analyzing the cases and in examining them, why I should give to a special condition the name of a special disease.

To illustrate: Some time ago I recorded the histories of two cases at the same time. Both were young girls twenty years of age; both brought up in practically the same manner, with about the same surroundings; in both the disease originated in the same way; the manifestations which presented themselves on the first examination were practically the same; the examination of the blood revealed the same conditions; the examination of the urine showed about the same conditions; the examination of the heart revealed almost exactly the same cardiac signs; the cardiac symptoms were the same. They were put on the same treatment, given the same general rules as to life, responded to treatment in about the same manner, and were discharged about the same time cured. They ran along parallel lines, side by side, with but one difference: one case had pallor; the other case had pallor, plus something else which gave a greenish hue to the complexion. I could not see why we should call one chlorosis and the other anæmia. I made the observation at that time that many of these so-called chlorotic cases had occasionally a malar flush. I also made the observation that many of these cases that had this were cases that previous to coming for treatment had a red complexion, not the occasional flush that comes, but the permanent rosy complexion that would mean that the capillaries were full of blood. Where that was permanent there was more or less pigmentary deposit, and pigmentary deposit means blood residue. Ptomaines and leucomaines have been isolated to the uttermost molecule; they have been brought out as solids and fluids: oils, liquids, and powders. If they are circulating in the blood from some disturbance, not passing out, but accumulating there, circulating there, they find in the cheek a nidus for absorption. That nidus is pigmentary deposit. That may produce a change in the red color, due to the blood residue, to a greenish hue.

That may be all fancy, but the observation on which it is founded, with the red face previous to being treated, and the occasional malar flush, are matters of fact. The other is perhaps fancy, but it may explain why the term chlorosis was not mentioned in this paper.

CONDENSED MILK, WITH REFERENCE TO PREVIOUS SKIMMING.¹

BY WALTER H. KENT, PH.D.,
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During the summer months the attention of the Department of Health was called to the fact that a certain brand of condensed milk sold in the market was made from skimmed milk, and in accordance with directions the particular brand complained of, and also the various other brands here sold, have been obtained and analyzed with reference to fraud of this kind.

Before presenting the results of this examination, it may be well to consider briefly the methods of determining by an analytical process, whether a given brand of condensed milk is really made from milk wholly, or in part, deprived of cream.

With ordinary milk this question may generally be answered by knowing the specific gravity and the amount of fat which the milk contains. But, when milk is condensed by evaporation, as is the case with that sold in bulk from the wagons, or condensed and preserved by the addition of 30 to 40 per cent. sugar, as is the case with most of that sold in cans, the question becomes somewhat more difficult. As the density, and also the amount of fat, may vary with the amount of condensation, as well as with the amount of sugar added, these factors either alone or together, would not be sufficient to determine whether the milk had at any time been robbed of one of its most valuable constituents.

The method here used is that given by Dr. J. Koenig in his celebrated work on the analysis of foods (*Die menschlichen Nahrungs- und Genussmittel*, Vol. II., p. 272).

Dr. Koenig makes the statement, that for every 100 parts of albuminous substance in cow's milk there are from 100 to 110 parts of fat, and that this relation must obtain in condensed milk. Or, in other words, the amount of fat must equal or exceed the amount of albuminous substances.

It will be remembered that the albuminous substances of cow's milk, or albuminoids, as they are frequently termed, are substances containing uniformly about 15.8 per cent. of nitrogen, and that they are of a sufficiently stable character to withstand the process of the evaporation of the milk without loss.

As by the evaporation of milk there is no loss of fat or albuminous substance, and as by the addition of pure sugar neither fat nor albu-

¹ Report made in November, 1888, to Dr. John Griffin, Commissioner of Health of the City of Brooklyn.

minous or other nitrogenous substance is added, the ratio of fat to the albuminoids must be the same in condensed as in normal cow's milk, and on these facts is based the method which Koenig gives.

Before accepting the statement, however, that the amount of fat in cow's milk does really equal or exceed the amount of albuminoids, and basing conclusions as to whether a given condensed milk is made from skimmed milk, it may be well to examine the statement as to whether it is really true. This can only be shown from the analysis of normal cow's milk with reference to the amount of fat and albuminoids such milk contains. Fortunately, such analyses have been made so many times by chemists of good repute that little more is necessary than to examine the published results. (See Koenig's *Nahrungs-und Genussmittel*, Vol. I., p. 30.) Below are given abstracts from the literature bearing on this point.

In January and February of 1883 Dr. S. M. Babcock made forty analyses of mixed morning and evening milk, in every case of which the fat exceeded the albuminoids (Second Annual Report of the N. Y. State Agricultural Experiment Station, 1883, p. 103.)

Dr. H. W. Wiley gives one hundred and forty-nine daily analyses of milk from Maythorpe dairy, College Station, Md., and eight of milk from various other sources, and in all cases the fat exceeded the albuminoids.

The average of the 149 analyses was :

Fat.....	4.08 per cent.
Albuminoids.....	2.78 per cent

and of the 8 analyses :

Fat.....	3.91 per cent.
Albuminoids.....	2.47 per cent.

—(U. S. Dept. of Agriculture, Division of Chemistry, Bulletin, No. 13, p. 115.)

Alexander, Mueller and Eisenstuch made fifteen analyses of morning and evening milk at various times during the summer of 1864 ; of these 12 contain more fat than albuminoids, while the three exceptions are found to contain less than .2 per cent. more albuminoids than fat (*Die landwirthschaftlichen Versuehs-Stationen*, Vol. V., p. 161, and Vol. VI., p. 3.)

P. Pertersen made five analyses from the Oldenburger breed and full blood shorthorns, in which the fat of four was in excess. In the case of the single exception, the excess of albuminoids was less than 1 per cent. (*Milchzeitung*, 1876, pp. 2179, 2191.)

Vernois and Becquerel made analyses of the milk of eleven different breeds at the Agricultural Exhibition in Paris in 1856, and in ten of these the amount of fat exceeded the amount of albuminoids, the exception being with a Norman breed (*Die Naturgesetze der Fuetterung*, von Gohren, 1872, p. 466.)

J. Moser and G. Belleville made fifteen analyses of the milk of different breeds exhibited at the Vienna Exhibition in 1873, and in every case the fat exceeded the albuminoids. Ten analyses were also made of other milks in which the average fat was 4.02 per cent. and the average albuminoids, 2.67 per cent. (*Milchzeitung*, 1874, p. 915).

W. Eugling analyzed the milk of an Italian cow, and found 4.54 per cent. fat and 3.49 per cent. albuminoids (*Milchzeitung*, 1877).

E. Marchand made eighteen analyses of milk from eighteen different breeds at the World's Exhibition at Paris in 1878, in all of which the fat exceeded the albuminoids (*L'industrie laitière*, 1878, No. 46.)

K. Portele analyzed twenty samples of milk from three different breeds, morning and evening, while experimenting with different kinds of feed, in January, 1880. In all cases the fat exceeded the albuminoids (*Die landwirthschaftlichen Versuchs-Stationen*, Vol. 27, p. 133.)

A. Voelcker made eleven analyses of cow's milk, of different breeds, at pasture alone and at pasture with varying amounts of oil-cake, in nine of which the fat was in excess (*Journal of the Royal Agricultural Society of England*, 1861, p. 33, and 1863, pp. 302, 309.)

J. Lehmann analyzed fourteen samples of milk of shorthorn and Holland cows while feeding various kinds of foods. In thirteen cases the fat was in excess; the exception being with a Holland cow on winter food, in which the fat was 3.11 per cent. and albuminoids 3.27 per cent. (*Der Landwirth*, 1869, pp. 1, 9). At another time Lehmann made four analyses, and in every case the fat was in excess (*Zeitschrift des landwirthschaftlichen Vereins in Bayern*, 1869, p. 261.)

M. Fleischer made ten analyses of the milk of two cows under varying conditions of feed, and in all cases the fat exceeded the albuminoids (*Journal f. Landwirthschaft*, 1871, p. 371; 1872, p. 395).

Kuehn, Gerver, Wackwarth, and Kisielinski give eight analyses of the milk of two cows fed with variations of food, in all of which the fat exceeded the albuminoids (*Saechsische landwirthschaftliche Zeitung*, 1875, p. 153.)

Kuehn, Aarland, Baesecke, Dietzell, Haas, and Schmidt publish forty-two analyses (*Journal f. Landwirthschaft*, 1874, pp. 168, 295; 1875, p. 481; 1876, p. 173; 1878, p. 168) of the milk of eight different cows, also made while experimenting on the effects of different kinds of feed. In thirty-nine cases more fat was found than albuminoids. The three cases in which the albnminoids are in excess are all with the same cow, and may be counted as one exception.

The figures in this case are as follows :

2.73 per cent. fat.	2.78 per cent. albuminoids.
2.82 “ “	2.85 “ “
2.69 “ “	2.72 “ “

In the table below, two analyses are given of bottled Orange County milk obtained from large dealers in the market of this city, both of which show more fat than albuminoids. As the milk in such cases is received into large tanks from which the bottles are filled, such samples may be considered as the average milk of a number of cows.

In the great number of analyses mentioned in the foregoing, it will be seen that the cases in which the albuminoids exceed the fat are exceedingly rare.

In the exceptions which do occur the differences are slight, and in all cases they are with foreign milk and not with milk of this country.

It is impossible to say to what extent the exceptions are due to typographical errors, or errors in analysis, as might occur, by the use of Wanklyn's method for the determination of fat, which is known to give uniformly less fat than the milk contains. We do know that the methods of milk analysis have been much improved in recent times, while it will be noticed that six of the nine exceptions occurred as far back as 1864. Some of the recorded results are excluded from consideration here, either for the reason that they are known to have been made by Wanklyn's method or that they were made too long ago to be thought reliable.

One of the exceptions occurred in March, and possibly it is due to the presence of colostrum which contains on an average four or five times as much albuminoids as fat.

It is also suspected that other exceptions may be due to a diseased condition of the cows, in which case an excess of albumen in the milk would be somewhat analogous to albumen in the urine in certain diseases. In this connection may be given the following interesting figures taken from some analyses of the milk of diseased cows made by A. W. Blyth (Journal of the Chemical Society, 1879, p. 534).

1st. Milk of cow suffering from pneumonia :

Pulse	82
Temperature	102.4°
Fat.	2.965 per cent.
Albuminoids.	4.29 per cent.

2d. A case of phthisis with a cow five years old, where there were extensive tubercular deposits in right lung :

	Dec. 7, 1878.	Feb., 1879.
Fat.	2.77 per cent.	3.83 per cent.
Albuminoids.	4.517 per cent.	5.765 per cent.

3d. A cow two years old in an advanced stage of phthisis :

	Jan. 29th.	Feb. 17th.
Fat	2.599 per cent.	3.28 per cent.
Albuminoids	3.00 per cent.	3.98 per cent.

4th. "A sample of milk drawn from an udder actually infiltrated with tubercular deposits:"

Fat	0.49 per cent.
Albuminoids	3.597 per cent.

The rule which König gives is, therefore, good, and with the normal milk of a number of healthy cows taken together it is true that the amount of fat exceeds the amount of albuminoids.

If market milk, or condensed milk, or milk condensed and preserved with pure sugar, is found to contain less fat than albuminoids, it may, therefore, be concluded that it is skimmed milk or made from milk deprived of cream to an extent at least proportional to the excess of albuminoids.

There may also be the suspicion that it contains colostrum or the milk of diseased cows, though with condensed milk this would not be probable, and it would hardly be just to the producer of the article to think this to be the case without other proof or circumstances which would support such a conclusion.

METHODS OF ANALYSIS.

Taking the Sample.—In each case below given, the sample was bought in the market as any consumer would buy.

Condensed milk preserved with sugar in cans, as is known, is in a viscid, semi-solid condition. From the manner of its preparation it was at first not thought necessary to take the precaution of mixing the sample before weighing out the portion for analysis, but this was soon found to be an error. It occurred to me that possibly during summer weather, or otherwise, the cans might become heated and sufficiently fluid to permit the fat to rise in the can, so as to make a difference in the composition of the two ends. A couple of experiments were therefore made to settle this point.

1st. *With Borden's Eagle Brand.* At one end the fat was found to be 6.16 per cent., and at the other end 4.94 per cent.

2d. *With the Anglo-Swiss Condensed Milk.* At one end the fat was found to be 5.72 per cent., and at the other 6.26 per cent.

Accordingly, in the work below given, the samples were thoroughly mixed before weighing out the portion for analysis. The weighing is conveniently done in a small bulbular pipette, into which the milk is drawn by the use of a Sprengle pump. The various portions for analysis are removed by attaching a short piece of rubber tubing and blowing out the viscid material and drawing back the adhering drop before again weighing the pipette.

ALBUMINOIDS.

As above stated, the albuminoids of milk contain 15.8 per cent. nitrogen. A determination of the amount of albuminoids may therefore consist in first accurately determining the amount of nitrogen and then in multiplying the weight of nitrogen by the factor 6.33.

The nitrogen is determined by Kjeldahl's method, as described by the Association of Official Agricultural Chemists (U. S. Department of Agriculture, Division of Chemistry, Bulletin No. 16, p. 64.)

One or two grammes of condensed milk is treated in the pear-shaped Kjeldahl flask with about 20 c. c. strong sulphuric acid and a small amount of mercuric oxide, at a temperature near the boiling-point of the acid, until nearly colorless. While still hot the oxidation is completed by the addition of minute particles of potassium permanganate. After cooling it is somewhat diluted with water, about 25 c. c. potassium sulphide added, and transferred to a retort with bent neck containing a few granules of zinc; 50 c. c. strong sodium hydrate solution is then added through a safety funnel, and the ammonia distilled off through a tin-lined condenser and collected in deci-normal hydrochloric acid. It is then tritrated back with deci-normal sodium hydrate solution, using cochineal as an indicator. Every cubic centimetre of deci-normal hydrochloric acid neutralized by the ammonia corresponds to 1.4 milligrammes of nitrogen or to 8.862 milligrammes of albuminoids.

FAT.

About one gramme of the sample is discharged from the weighing bulb into a plenty of sand which has been freed from organic matter by ignition. The milk is then saturated with sand by the aid of a small glass rod and allowed to dry at 100° C. It is then pulverized and transferred, together with the rod, to the Soxhlet extractor (Journal of the American Chemical Society, Vol. IX., p. 182), where the fat is thoroughly extracted with ether.

WATER AND ASH.

One or two grammes of the sample is transferred to a small dish which has been previously weighed with a small glass rod. It is thoroughly dried at 100° C., with occasional stirring. The water is determined from the loss in weight. About the same quantity is transferred to a platinum dish, dried and ignited at a dull red heat, and the ash weighed.

The samples analyzed are included in the following table.

From the rule which König gives, and which for healthy milk abundant evidence shows to be true, it must be concluded that samples 3 to 19 incl. were made from milk the cream of which had been more or less removed.

In some cases, where more than one analysis is made of the same brand, a considerable difference is noticed in the results. As condensed milk is made in batches, such differences may of course arise from unequal evaporation or the addition of varying amounts of sugar, or, where skimming is done, by removing unequal amounts of cream. Were the milk not skimmed, the latter chance for inequality would be removed and a compound of more uniform composition would be expected.

With regard to the sanitary effects of condensed milk made from skimmed milk, and especially its action on young children, I refer to the Report of the Brooklyn Health Department for the year 1886, p. 60, and also to some remarks by Dr. E. H. Bartley in Vol. I., p. 180 of THE BROOKLYN MEDICAL JOURNAL.

It will be remembered that milk sold in the market must contain, according to legislative act (Laws of 1887, Chap. 430), at least 3 per cent. of fat; while with several brands of condensed milk, if diluted according to the directions given for making milk, they would contain much less than that amount.

The 25 or 30 per cent. of water of the condensed milk is, of course, a remaining portion of the 87 or 88 per cent. which ordinary milk contains.

TABULAR STATEMENT.

No. of Sample.	BRAND, Etc.		Price.	Per cent. Fat.		Per cent. Albuminoids.		Per cent. Water.		Per cent. Ash.	
1	Bottled Market Milk—dairy A.	.....	8 cts. a quart.	4.07		3.37		87.08		.69	
2	" " B	.....	" "	3.81		3.24		87.43		.99	
3	Anglo-Swiss Condensed Milk.	.....	1 lb. can, 14 cts.	5.88		7.03		23.07			
4	" "	.....	" "	6.06		8.41		26.37		1.88	
5	Rose Brand.	.....	1 lb. can, 10 cts.	7.16		8.32		26.63		1.80	
6	" "	.....	" "	6.91		8.34		.....		.....	
7	Rigi Brand, Franco-Swiss Company	.....	1 lb. can, 13 cts.	0.22		.....		25.08		.....	
8	" "	.....	" "	0.70		8.88		30.90		2.27	
9	Eagle Brand, New York Condensed Milk Company.	.....	1 lb. can, 17 cts.	6.04		8.21		23.69		1.67	
10	" "	.....	" "	5.48		7.83		.....		.....	
11	Crown Brand.	.....	1 lb. can, 15 cts.	7.28		7.86		30.00		1.89	
12	" "	.....	" "	6.13		8.42		.....		.....	
13	Daisy Brand.	.....	1 lb. can, 12 cts.	6.10		8.41		26.66		1.59	
14	Champion Brand.	.....	1 lb. can, 10 cts.	5.18		8.33		24.58		1.88	
15	" "	.....	" "	4.73		8.53		.....		.....	
16	Dime Brand	.....	12 oz. can, 10 cts.	5.78		8.54		25.13		1.86	
17	" "	.....	" "	6.51		9.02		.....		.....	
18	Osprey Brand, S. W. Canfield	.....	1 lb. can, 13 cts.	4.93		9.04		26.57		1.91	
19	" "	.....	" "	9.44		9.18		.....		.....	
20	Nestle's Condensed Swiss Milk.	.....	1 lb. can, 16 cts.	8.77		10.16		24.84		2.00	
21	Darling Brand, Michigan Condensed Milk Company.	.....	1 lb. can, 10 cts.	10.93		10.50		24.84		1.81	
22	Condensed Milk from wagon, New York Condensed Milk Co.	.....	.....	13.17		.....		59.81		2.14	
23	" " S. W. Canfield.	.....	.....	.....		.....		59.43		2.19	

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

THE ABUSE OF CHARITY.

The paper of Dr. Emmett D. Page, which appeared in the November number of the JOURNAL, contains much food for reflection, and, if the statements therein contained represent the actual and permanent condition of the dispensaries of Brooklyn, vigorous action should be taken to reduce their number, and to change the practice in those that remain. This paper shows that the dispensary system, as it now exists, is demoralizing, and has a tendency to educate the people to be dependent and pauperish, and that patients without number obtain at the dispensaries free advice and medicine, when they are abundantly able to pay a reasonable amount to a physician for his services. One instance he cites, in which a frequent attendant at a dispensary left at his death \$7,000 to his wife, and \$14,000 besides to his church. This incident may be exceptional, but if so it is only in the amount of money possessed by this beneficiary. We presume that there is no physician connected with a dispensary, who has not repeatedly treated gratuitously persons whose dress and appearance indicated that they were fully able to pay for the physician's services, and yet should he intimate such a thing, it would be at once said that he was making an improper use of his position. That this abuse of charitable institutions is not confined to Brooklyn, but exists wherever there are dispensaries and hospitals is well-known. The *Physician and Surgeon* says that of sixty cases of senile cataract treated at the Ann Arbor Clinic, ninety per cent. were eminently able to pay for a private operation. In one week among the cataract patients who were operated upon, an investigation showed that there were four patients, the poorest of whom was worth over \$15,000, one estimated his wealth at \$40,000, another had given the bulk of his property to his children, but retained two hundred acres of cultivated land, well improved and completely stocked, while the fourth was worth over \$300,000. The fourth, or richest of these, was not a resident of the State of Michigan.

Dr. Page makes a very valuable suggestion when he calls the attention of the "Physicians' Protective Alliance of the City of Brooklyn" to the matter, and expresses the hope that among other benefits from this organization, may be a remodelling of the institutions referred to in his paper.

THE COLLAPSE OF SCOTCH OATS ESSENCE.

It is not often that one has an opportunity of chronicling so signal a triumph of science over charlatanry as is furnished by the complete overthrow of this patent medicine. Our readers will doubtless remember Dr. Eccles' analysis of the compound, and the efforts which medical journals and others put forth, based on the analysis, to show the danger of its continued use, and the fraudulent pretensions of its manufacturers. As a result of this warfare, so energetically and skilfully undertaken in the public interest, we have the pleasure of recording, on the authority of a New York paper, that the effects of the "Scotch Oats Essence" Company were recently sold out by the sheriff. Sixty-three gross of the essence realized about four cents a bottle, the retail price being a dollar. We congratulate Dr. Eccles most heartily, and think that he may well pride himself on the result of his undertaking.

IS THE MEDICAL PROFESSION OVERCROWDED?

That there are already as many physicians as are needed seems to be the opinion of the laity, if we may judge from the remarks which are made at each recurring commencement of our medical colleges, when from fifty to two hundred graduates are sent forth to practice the healing art. It would be difficult to ascertain the opinion of the entire profession on this question. A writer in the *Hospital Gazette*, at the opening of the winter session of the London medical schools, said: "I should be only too pleased on the present occasion to congratulate the hundreds of new students who will read these notes to-day on having chosen medicine as a profession could I honestly do so, but I regret to say that I cannot. Only a few years ago to possess a medical qualification was to command respect, position and most probably wealth. In a few years all has changed. The profession is frightfully over-crowded, and it would not be exaggeration were I to say that there are hundreds of well qualified and able doctors almost reduced to beggary. Twelve or fourteen years ago sixpenny dispensaries were known only to the lowest costermonger districts of the metropolis. Now they swarm all over London, and seem to thrive well even in the most aristocratic parts of the West End. Consequently, doctors who conduct their practices on the old lines find their incomes falling off, and many are in dire straits." The fact probably is that in some communities there are more physicians than are needed, and in others not enough, and nowhere, we venture to say, is there to be found any community which is overstocked with competent, skilful and educated physicians.

TYPHOID FEVER ON LONG ISLAND.

That typhoid fever is ever present in Brooklyn is a recognized fact. That it also exists to any considerable extent on Long Island, outside of this city, has, so far as we know, never been stated, nor has attention ever been especially called to this subject. Dr. W. A. Shufelt, of New York, in a letter to the *Medical Record*, says that the fever was prevalent among the farmers of Long Island during last summer. He saw two characteristic cases at Bath Beach, and there were many guests in the same hotel suffering from malaise, headache, and diarrhœa, with slight elevations of temperature. He was informed, on good authority, that there were twenty cases of typhoid at Bath during last summer. He was unable to trace the cause of this epidemic, though he thinks that one case, at least, was due to bathing in the bay, where a large amount of sewage drifts⁴ in and may be seen at low tide. In fact, the disease was more prevalent among those who bathed a great deal. Many of the milder cases improved as soon as they were put upon sterilized milk and water. If the facts are as represented by Dr. Shufelt, Bath Beach is in need of the immediate attention of the sanitary authorities, and unless there is a radical improvement, its value as a summer resort will justly decline.

THE BROOKLYN EYE AND EAR HOSPITAL.

The twentieth annual report of this institution has just been published, and, as usual, shows a vast amount of work done during the past year. Nearly 8,000 patients were treated during this period, of which number 985 required surgical operations for their relief and cure. 27,505 visits were made by patients. Since the organization of the hospital 87,695 patients have been treated, the number of visits made by them aggregating 400,000. Upon these facts, showing the labor of the staff and the charity bestowed on the poor, the Directors make an appeal for continued support. A detailed statement of the cases treated is given in the report; which also contains a portrait of Dr. C. R. Agnew, and the minutes of the Board of Directors relative to his death, and to that of Drs. C. L. Mitchell and E. G. Loring, and Mr. D. C. Robbins, all of whom had been intimately associated with the Hospital. The large representation of physicians in the Directory of this institution should entitle it to the hearty support of the profession of Brooklyn. In the list of its Directors are the names of Drs. Colton, Mathewson, Prout, Joye, Rushmore, Waterworth, Raub, Ingalls, Lennox, Jewett, Raymond, Hoagland and Brinkman.

BOUND COPIES OF THE JOURNAL.

Bound copies of the JOURNAL are now ready for distribution, and may be obtained at the Society Rooms, 356 Bridge street, in exchange for the unbound numbers, on payment of fifty cents a volume, or one dollar for the entire year.

PROGRESS IN MEDICINE.

OBSTETRICS.

BY CHAS. JEWETT, M.D.,

Professor of Obstetrics, Long Island College Hospital.

THE BACTERIOLOGY OF PUERPERAL FEVER.

Czerniewski (Arch. f. Gyn., B. xxxiii., H. I.,) in an elaborate paper discusses some of the unsettled questions of puerperal bacteriology. Many authors are of the opinion that the streptococcus is the specific microbe of puerperal fever, at least that which pertains to the severer forms of fever (Pasteur, Lomer, Gönner). Of the cause of the lighter forms there is as yet no settled opinion.

Fritsch makes two forms of fever. Septic or severe and non-septic or light, believing that the septic fever may be produced by non-pathogenic organisms.

Olshausen separates the non-malignant (peri- or parametric) from the septic variety without attempting to explain the difference in the pathogeny. Charpentier recognizes a traumatic and a septic fever. Schroder says putrefaction of lochia may occur from access of atmospheric germs.

Zweifel does not commit himself on the question whether the lighter varieties of puerperal fever are of septic origin or not. The severer form he ascribes to the chain cocci. He apparently thinks the chain cocci may in certain cases cause only the milder grades of fever. The larger proportion of the lighter forms are produced by the absorption of putrefactive products (ptomaines, sepsin).

Charles appears to be of the same opinion as Charpentier. So far as the writer knows Crédé is the only authority who takes a decided stand on the theory that all grades of childbed fever are due to infection with one and the same poison. The different results of infection he attributes to differences in the resisting power of the organism, the

sites of invasion and channels of diffusion. If the peccant germs expend their force upon the tissues, the lighter forms of fever result; if they gain access to the blood or lymph-vessels, the graver forms are produced.

Rosenbach, Passet, Norden, Mejerowitz, Biondi, and others declare the identity of the pyogenic streptococcus and that of erysipelas. Pawlowsky, Hoffa, Winckel believe them to be different organisms.

Dr. C. has studied the subject by the aid of an elaborate series of bacteriological investigations conducted in the lying-in hospital at St. Petersburg. He examined the lochia of sick and healthy puerperæ and the fluids from the cavities of bodies dead of puerperal fever, and made cultures therefrom. His conclusions are as follows:

1. Micro-organisms are very seldom found in the uterine cavity or the lochia of healthy puerperæ.
2. The lochia of healthy lying-in women possesses neither phlogogenic nor pyogenic properties.
3. In most cases of light puerperal fever the streptococcus may be found in the uterine cavity and the lochia.
4. In fatal cases of childbed fever (septicæmia, lymphatic form), the streptococcus is found in the lochia, and after death in all the organs and fluids of the body.
5. The streptococci of the light and of the fatal forms of fevers are one and the same organism.
6. The streptococcus of puerperal fever by inoculation in animals is capable of producing abscess or erysipelas.
7. In sick puerperæ the streptococcus gives rise to a degeneration of the parenchymatous organs, hyperæmia of the serosa, and to more or less exudation.

ANTISEPTIC OBSTETRICS.

Fischel (*Am. Jour. Med. Sci.*, Nov., 1888,) says the mortality rates of the large maternities of Austria, Germany, Russia, and Bohemia show a diminution of about fifty per cent. from sepsis since the adoption of antiseptic practice. In private practice on the Continent the mortality is probably much greater than in maternities, owing to a less perfect asepsis.

Fischel urges that physicians be thoroughly drilled in innocuous antiseptics, and that maternities be so managed as to give the fullest advantages for practical study. That this may be safely done with proper discipline is apparent from the fact that during the winter of 1886-87 no case of septic infection occurred in Fischel's wards despite the free access of students to the service and their participation in the examination of patients and the management of labors.

PUERPERAL PSYCHOSES AND SEPTIC INFECTION.

Hansen (Am. Jour. Med. Sci., Nov., 1888,) in forty-nine cases of psychic disturbance in childbed found septic infection in forty-two. In forty of these cases the mental disturbance was that of hallucinations; in the remaining two, mania and hallucinations were present. In the severe non-septic cases, one had acute tuberculosis, four had been epileptic or eclamptic. Hansen concludes that the majority of cases of puerperal psychoses are due to septic infection or eclampsia.

When a puerperal psychosis develops early, characterized by acute hallucinations, in the absence of any other infection and without eclampsia, the diagnosis of puerperal infection is justified, even in the absence of fever and other symptoms ordinarily present.

ÉCOUVILLONNAGE IN POST-PARTUM SEPTICÆMIA.

(Annals of Gynecol.) This method of treatment in puerperal septicæmia, originating in the uterine cavity, bids fair to occupy an important place in obstetric therapy. At a meeting of the Society of Medicine of Salonica, Misrachi reported thirty-eight cases of post-partum septic endometritis treated by brushing out the cavity of the uterus with the écouvillon, or ramrod mop of Doleris. Thirty-seven were immediately cured. Misrachi believes that the écouvillon if carefully handled with rigid antiseptic precautions is never a dangerous instrument; safer than intra-uterine injections and more efficacious. Anæsthesia is not required. The time is not far distant when the physician who relies on drugs and stimulants and leaves necrotic and septic shreds and clots in the uterus will be justly condemned, not only by the profession but also by intelligent laymen. [It might be added that the écouvillon, while no more efficacious, is simpler and safer in inexperienced hands than the curette.]—J.

SCARLATINA IN CHILDBED.

Meyer (Zeitschr. f. Geb. u. Gyn., B. xiv., H. 2,) tabulates twenty one cases of puerperal scarlatina, and discusses the subject at length. All were characterized by a short incubation period (three to five days), deep red color of the eruption and mildness of the throat symptoms. The date of the invasion varied from the first to the fourteenth day after labor; the duration of the fever from two to sixty-eight days. In six cases the disease pursued a mild course without septic complications. Grave pelvic inflammations developed in eight, in two resulting fatally.

Puerperal scarlatina is liable to become complicated with septic infection of the obstetric wounds. The wounds become the seat of

diphtheritic ulcers in puerperal as in surgical scarlatina. For prophylaxis of the septic complications the usual antiseptic measures and infrequency or avoidance of vaginal examinations are important.

EXTRA-UTERINE PREGNANCY OCCURRING TWICE IN THE SAME PATIENT.

Lawson Tait (*Br. Gyn. Jour.*, August, 1888,) narrates a case in which ruptured tubal pregnancy occurred twice in the same patient, a normal pregnancy intervening. The first ectopic pregnancy was tubal and ruptured into the peritoneal cavity toward the end of the third month. Laparotomy with removal of the right fallopian tube was followed by an easy and prompt recovery. Eighteen months later the patient was delivered of a full term child after a normal labor. She again became pregnant in about fifteen months after this confinement. With the exception of occasional abdominal pains this pregnancy was uneventful till the end of four and a half months. She was then, after slight exertion, seized with acute hypogastric pain, collapse and the signs of internal hæmorrhage, death supervening in a few hours. The post-mortem revealed an interstitial tubal pregnancy of the left side. A strong septum of uterine tissue separated the true uterine cavity from that containing the ovum. The rupture had taken place in the upper and back part of the left uterine cornu. [Mr. Tait, while he found no difficulty in recognizing the true condition of things in the first pregnancy after rupture, still avers the impossibility of diagnosis in tubal gestation before rupture. Yet in another place he states that in the enormous experience he has had in tubal pregnancy, he has never but once been called upon to make an examination until the rupture had occurred. He points somewhat triumphantly to the impossibility of recognizing the true state of affairs in his case of interstitial pregnancy. Others, however, have been able to arrive at a presumptive diagnosis, even in this difficult class of cases all-sufficient to warrant attempts at electrical foeticide, yet not sufficient to justify laparotomy. Just here lies one of the strongest arguments for electricity. It may be used before the diagnosis can be made certain and no harm be done. If the case be, in fact, one of misplaced pregnancy, a life may be saved which would be lost by waiting for a condition of things that would justify abdominal section.]

PREGNANCY IN A RUDIMENTARY UTERINE CORNU—LAPAROTOMY—
RECOVERY.

Rosthorn (*Am. Jour. Med. Sci.*, Jan., 1889,) has reported a case of pregnancy in a rudimentary uterine cornu. The patient was a primigravida of twenty-three years, in whom menstruation had ceased for fourteen months, then returning scantily. An abdominal tumor

extended to the umbilicus. The patient's general health was undisturbed. The uterus was slightly elongated, the tumor springing from the right cornu. Laparotomy was done with the expectation of finding an ovarian cyst or a uterine fibro-cyst. The sac contained the remains of a decomposed fœtus of eight months and a chocolate colored fluid. Adhesions were separated, a portion of the uterine tissue at the pedicle was resected and the tumor removed. Hæmorrhage was prevented during the operation by the use of an elastic ligature, as in Cæsarean section. The broad ligament was sutured and a tampon of iodoform gauze inserted at the lower angle of the wound. The patient recovered. This class of cases usually rupture fatally at four to six months. Rosthorn advises Porro if the child is living, if dead amputation of the cornu, treating the stump by intra-peritoneal suture. Breisky's and other recent successes have shown the feasibility and advantage of removing the entire sac.

FORMATION OF THE LOWER UTERINE SEGMENT.

Blanc (Nouv. Arch. d'obstet. et de Gyn.), from a clinical study of this subject, arrives at the following conclusions. In the majority of cases dilatation of the cervix takes place during the last two weeks of gestation, its walls merging into those of the inferior portion of the uterine cavity. Occasionally the cervix remains intact till labor begins, especially in primigravidæ. The development of the lower uterine segment begins at a long period before any modification of the cervix has taken place. The upper or outer limit of this segment is the contraction ring, the lower or inner limit of the os internum. The upper portion of the cervix may contribute to the formation of this zone during the last weeks of pregnancy. Immediately after the close of labor the contraction ring is the obstetric os internum. The anatomical os internum is re-established later, in the course of involution.

HYPEREMESIS GRAVIDARUM.

Guenther (Arch. Gyn., Dec., 1888,) found electricity of great service in five cases in which no pathological condition of the uterus or other pelvic organs could be detected. In these cases the affection was clearly a neurosis. The constant current was used in strength of two or three to five milliampères. The anode was placed against the cervix and the cathode (four by five inches) over the spine between the eighth and twelfth dorsal vertebræ. Seance of seven to ten minutes once daily. Interruptions of the current must be avoided, lest they may cause abortion.

Hennig (*Am. Jour. Med. Sci.*, Oct., 1888,) refers the milder form to inflammatory lesions, wounds or dislocations of the uterus, or even to distended bladder or rectum. The graver form he considers a neurosis. Saenger has seen a case due to laceration of the cervix and which was relieved by trachelorrhaphy.

Hewitt found uterine displacements in fifty or more cases of the vomiting of pregnancy, complete relief following reposition.

FORCEPS DELIVERY IN MINOR DEGREES OF FLAT PELVIS.

Dr. R. Milne Murray (*Ed. Med. Jour.*, Nov., 1888,) discusses the effect of compression upon the foetal skull in forceps extraction in flattened pelvis. It will be remembered that in slight narrowing of the anterior conjugate the head engages with occipito-frontal diameter in the transverse of the pelvis and with the sagittal suture level. The forceps seizure grasps the head by the occiput and sinciput. Dr. Murray has proved by experiments upon the foetal cadaver that the compression causes the occipital and frontal bones to glide under the parietals, the latter bones moving upward. The compensatory elongation does not take place to any extent in the biparietal and bitemporal diameters of the head, as obstetric writers have assumed, but is mainly confined to that diameter which corresponds to the pelvic axis. Thus, complications by the conjugate are not increased by the forceps compression. The advantage which he claims does not obtain except when the seizure is by the occiput and sinciput. An oblique seizure elongates that diameter which engages in the conjugate, since the parietals are included in the grasp.

Dr. Murray has omitted to mention the possible complication in forceps delivery in flattened pelvis from the effect of compression in causing premature flexion and also, in slightly oblique seizures, premature rotation of the head.

The greater success of axis traction forceps in flat pelvis than is possible with the classic instrument is due wholly to the fact that the direction of the force may be conformed to the abnormal pelvic axis with the axis traction instrument. The error of the older form of forceps is greatly increased by the special features of the flat pelvis. The writer takes pains to emphasize the fact that the advantage of the axis traction forceps consists not in the increased power of the instrument, but rather in the lesser amount of force required by reason of the improved line of traction. If a reasonable amount of force in the best direction is not sufficient to effect delivery, some other means should be adopted. In a justo minor pelvis forceps are contra-indicated, unless they can be applied over the poles of the occipito-frontal

diameter. An oblique or asymmetrical grasp will not effect the telescopic adjustment above indicated and thus will at best offer no advantage.

PATHOGENY OF HYDRAMNIOS.

Dr. Mantel (Arch. de Tocologie), while recognizing the influence of syphilis, malformations, etc., argues that low implantation of the placenta may alone account for the pathology in many instances. He cites cases to prove the frequent association of hydramnios with vicious placental insertion. The placental and umbilical circulation are impeded by undue pressure; venous stasis and excessive transudation of fluid into the amniotic cavity result. The persistence of the *visa propria*, or capillary network of Jungbluth, which is believed to be the source of the osmosis, is favored by the excessive pressure.

THE NEW CÆSAREAN SECTION.

In a paper read before the last meeting of the American Gynæcological Society, Dr. Lusk reports three cases of the Saenger operation, with two recoveries, the third case dying from cancer sixty-two days after the operation. All the children were saved, except one which died of trismus several hours after delivery. According to Harris, the mortality of the Cæsarean operation in Germany has been reduced from 27 to 8 or 10 per cent. since the use of antiseptics. This advantage obtains alike in craniotomy, which in skillful hands is a safer operation in a suitable case than Cæsarean section. Yet with a conjugate of two and one-half inches or less, as a rule the Cæsarean is the preferred operation. The tendency of recent improvements is to extend the field of the latter operation.

Caruso (Archiv f. Gyn., B. xxxiii., H. 2) tabulates the cases of the new operation since the fiftieth up to October, '88. The total number of recorded cases was then one hundred and thirty-five. Six others, all successful, had come to his notice, the details of which had not been published. 74 $\frac{1}{10}$ per cent. of the mothers and 91 $\frac{7}{10}$ per cent. of the children were saved. The mortality of the Saenger operation may therefore be stated as one in four mothers and one in ten children. Comparing the results of Cæsarean section and aseptic craniotomy in similar cases, Caruso finds 89 $\frac{1}{10}$ per cent. of recoveries in the former and 93 $\frac{1}{10}$ in the latter. The Cæsarean is therefore the preferred operation if the child be living.

A similar comparison with induced labor yields the preference also to Cæsarean section, since the fœtal mortality in favorable cases of induced labor is 39 per cent. The mother should be informed, however, that the danger to herself is greater in abdominal section than in crani-

otomy, and the choice of the conservative operation furthermore assumes that the patient is in good condition and the foetal heart sounds strong. C. thinks manual compression less likely to be followed by hæmorrhage than the use of the elastic constriction.

Dr. J. S. Coleman (*Am. Jour. Obstet.*, November, 1888) reports a case of Cæsarean section necessitated by hypertrophic elongation of the cervix.

PURULENT PUERPERAL PERITONITIS SUCCESSFULLY TREATED BY ABDOMINAL SECTION.

Woodward (*Boston Med. and Surg. Jour.*, July 12, 1888) reports a case in which peritonitis resulted from the rupture of a puerperal abscess about six weeks post-partum. The abdomen was opened and the cavity washed out with a one to one thousand hydronaphthol solution. A drainage tube was inserted and the peritoneum repeatedly irrigated with boiled water, the patient making a good recovery.

THE NORMAL PUERPERAL TEMPERATURE.

Temesvary and Bicker (*Arch. f. Gyn.*, B. xxxiii., H. 3), in a paper on the physiological course of childbed, make the following observations with reference to the temperature. At the close of labor the average temperature in their experience was 99° , higher after long labors, notable wounds or much hæmorrhage, and higher after first than subsequent labors. During the first day post partum the temperature rises for six or seven hours to a maximum of 37.16° C. (nearly 99° F.), then falls during the succeeding ten to thirteen hours to a minimum of 36.85° C. (98.3° F.). As a rule, the first day's temperature has no special prognostic importance. During the remainder of the post-partum week a more or less uniform diurnal variation is the rule. There is a morning exacerbation from 4 to 10 o'clock, and an evening remission from 6 to 12 o'clock; an even high temperature from 10 A. M. to 6 P. M., and an even low temperature from 12 P. M. to 4 A. M. The regular diurnal variation in fever-free patients averaging $.73^{\circ}$ C. (1.3° F.), the daily range in healthy non-puerperæ being $.51^{\circ}$ C. ($.9^{\circ}$ F.). The physiological limit is about 37.5° C. (99.5° F.) in the axilla, 37.8° C. (100° F.) by the rectum. In general, the daily range varies but little between the second and the sixth day, gradually diminishing thereafter. Yet digestive disturbances, the establishment of milk secretion, mental excitement, retention of lochia, constipation, etc., as Credé has observed, may give rise for a time to much higher temperatures in healthy puerperæ.

HEGAR'S SIGN OF PREGNANCY.

The most conclusive signs of pregnancy in the first three months are to be found in the changes which take place in the size, shape, and consistence of the body of the uterus. These changes are the natural result of the lodgment and growth of the globular ovum in the uterine cavity. The body of the uterus bulges out as the ovum develops, its lateral borders become rounded, and there is a distinctly marked bellying of the anterior wall. After from four to six weeks' development this segment of the uterus presents in a very perceptible degree the characteristic elasticity of the fluid cyst which it contains. To the well-trained touch the bellying of the lower segment of the uterus, especially its anterior wall, and its fluid elasticity, are sufficient for the diagnosis of pregnancy in a large number of cases from the fourth to sixth week. These signs are obtained by the "bimanual," as practised in ordinary gynæcological examinations.

To the signs above mentioned, Hegar has added another. This consists in the marked softening and thinning of that portion of the corpus uteri immediately above the cervix, especially as obtained by Hegar's method. His method of examination is as follows:

A preliminary distention of the rectum with water may be necessary to facilitate the manipulation. Chloroform may be used if required. Depressing the uterus with one hand over the abdomen, pass the index finger of the other hand into the rectum, up through the third sphincter, and press the finger tip against the posterior wall of the uterus immediately above the utero-sacral ligaments. Pass the thumb of the same hand into the vagina and bring it in contact with the anterior wall of the uterus just above the cervix. The intervening tissues may in most cases, during the last half of the second month, be compressed by the grip of the thumb and finger almost to the thinness of a visiting card. This compressibility of the lower uterine segment thus obtained is Hegar's sign. It has been confounded by writers with the before-mentioned changes in the uterus, from which, as a sign of pregnancy, it is entirely separate and distinct.—J.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

The following papers will be read at the March meeting: "Vertigo," by John C. Shaw, M.D., and "Cancer of the Pancreas," by George McNaughton, M.D. Dr. A. R. Matheson, the president of the Society, invites the members to discuss these papers fully, and requests that those who purpose taking part in the discussion will send their names to him.

REVIEWS.

A MANUAL OF DIETETICS FOR PHYSICIANS, MOTHERS AND NURSES. By W. B. Pritchard, M.D. Published by the Dietetic Publishing Co., New York.

The importance of the subject, treated in this handy volume of eighty-eight pages, is aptly illustrated by the author in his statement that of 800,000 deaths which occurred in the United States in 1886, 500,000 were children under five years of age, and that at least two-thirds of these deaths were consequent upon improper feeding; and that to exposure, adverse atmospheric influences with improper clothing, irregular habits, bad hygienic surroundings, and many of the social customs and requirements of modern so-called civilization the rest of these deaths are due. The author believes that a more general and practical knowledge of the principles of physiological digestion and food assimilation, together with a comprehension of the subject of the proper hygiene and management of infancy and childhood, would lead to a higher standard of health and a lower death rate. With the object of disseminating and emphasizing these principles this Manual was written, not alone for the mother and nurse, but also for the physician, who is, to a considerable degree, responsible for the health and happiness of the children.

In discussing the management of the new-born child, the proper method of bathing is fully described. The author very sensibly deprecates the use of soap-suds immediately after birth, calling attention to the tender condition of the skin at this period of life. The method of dressing the cord is dwelt on at considerable length, and we are glad to see that the usual plan of applying grease of some kind on a pad is condemned. The proper times for nursing the infant, the indications for weaning, and the advantages and disadvantages of wet-nursing are sufficiently dwelt on. Artificial feeding is regarded as of such importance as to call for an entire chapter, in which human and cow's milk are compared, and the merits and demerits of the various artificial foods in the market discussed.

Of the infant foods the author speaks in the highest terms of malted milk, and refers to Drs. Goelet and J. Lewis Smith, of New York, and Dr. A. J. C. Skene, of Brooklyn, as having used it with great satisfaction. Methods of feeding the sick are described at considerable length. The Manual, taken as a whole, is a valuable practical contribution to the subject of dietetics, than which no part of the practice of medicine is more important.

THE BROOKLYN EAGLE ALMANAC, for 1889.

Its compilation is very complete, containing not only the calendars of days of the month and time of sun rising and setting, but information on almost every subject connected with our city, and our municipal, State and National Government, and is very useful in every respect.

The medical man finds it convenient to turn to the pages giving information concerning the various hospitals, dispensaries and other institutions of the city, together with the societies, libraries, &c.

We miss the map of Long Island, which we found such a convenience last year, but have remedied the defect by tearing it from our copy for 1888 and inserting it in the present one. Our library has been credited with less than half the number of volumes it contains, and the *Eagle* has evidently not yet awoke to the fact that it is a free public library, open to any interested in our specialty, while, like almost every one else, they have failed to get the corporate title of our society correct. It is the Medical Society of the County of Kings, not of Kings County.

TRANSACTIONS OF THE ASSOCIATION OF AMERICAN PHYSICIANS. Third session, held at Washington, D. C., Sept. 18, 19 and 20, 1888. Vol. III., 8 c. Philadelphia, 1888.

A more than usually interesting volume, containing twenty-five original articles, many of them exhibiting great research and of great value to the profession.

Typhoid fever is written upon by W. W. Robinson, M.D., with a paper on its geographical distribution in the United States, treating on its relation to fevers of malignant origin, and to obscure and unclassified forms of continued fevers.

James H. Hutchinson, M.D., devotes a valuable article to the "Management of its Stage of Convalescence," with remarks as to its sequelæ, including a very full and valuable bibliography of the subject.

Dr. George Ross considers "Some Forms of Paralysis after Typhoid Fever," and Dr. J. C. Wilson furnishes what he calls "A Clinical Experiment on Causa-Therapeutics in the Infectious Diseases, Enteric Fever and Phthisis," while the volume is closed by a brief article by P. Gervais Robinson, M.D., on the Continued Fevers of the Mississippi Valley.

Prof. A. Jacobi gives a valuable "Contribution to the Anatomy and Pathology of the Thymus Gland," beautifully illustrated with seven plates taken from frozen sections, through the thymus of a newly born normal baby, cut from one-half to one centimetre apart, representing the full size of life, and seven plates representing the microscopic appearances in different diseases of the gland. This is the most important contribution to the normal and pathological histology of the thymus gland we have met with.

Professors E. G. Janeway, Robt. T. Edes and James T. Tyson contribute excellent papers on the Absolute and Relative Value of Albuminuria and Casts in the Diagnosis and Prognosis of Renal Disease.

Dr. S. C. Chew discusses Angina Pectoris in its Relations to Chronic Interstitial Nephritis.

Prof. A. L. Loomis, in a paper on the "Cardiac Changes in Chronic Bright's Disease," presents in a tabulated form the renal, cardiac and vascular changes which were found at the autopsies of forty cases of chronic Bright's disease.

Dr. George M. Sternberg details his recent researches relating to the etiology of yellow fever, with a plate illustrating various cultures of bacilli. He states his conclusions briefly, viz.: "The specific infectious agent in yellow fever has not yet been demonstrated."

The volume contains, also, valuable articles from the pens of Drs. Wm. H. Draper, F. Forchheimer, Frank Donaldson, J. M. Da Costa, G. Baumgarten, James K. Thacher, George L. Peabody, E. C. Seguin, F. T. Miles, Wm. Osler, Frederick P. Henry, Edward Solby and Beverley Robinson.

The book is neatly gotten up, but the publishing committee have neglected to tell us where new members of the society can purchase it.

HAND BOOK OF MATERIA MEDICA, PHARMACY AND THERAPEUTICS. By Cuthbert Bowen, M.D., B.A. 12, c. F. A. Davis, publisher, Philadelphia, 1888. Price, \$1.40, net. *

This little book belongs to the class of compendiums, "essentials of," etc., or, in other words, "cram books," for candidates for the examination room. They can only be of real value to the advanced and busy practitioner who has become "rusty" as to details and wishes to refresh his memory preparatory to coming up before a new board of examiners, as in removing from one State or jurisdiction to another.

To the younger candidate they are dangerous, for the reason that they are studied and depended upon to the exclusion of the more voluminous and instructive text books.

Who of us desires to trust his prescriptions to the "registered pharmacist" who has learned all his *materia medica* and theoretical pharmacy from a "Hand Book;" yet this is what we are in danger of doing, for the person who has just "crammed" his head with the contents of this book will possibly pass any board of examiners on these subjects in the country.

This book is an excellent one of its class, giving a *résumé* of all the drugs recognized by the U. S. Pharmacopœia and their official preparation, and will have a large sale among candidates for the pharmaceutical "green room."

It will find favor, too, with the across-the-counter prescribing apothecary, on account of the multitude of prescriptions for various diseases which it contains, which are separately indexed under the name of the disease they are supposed to cure. There are seven prescriptions for asthma, ten for dysentery, eight for gonorrhœa, etc. We cannot help thinking "a little knowledge is a dangerous thing."

THE NATIONAL FORMULARY OF UNOFFICIAL PREPARATIONS. By the authority of the American National Pharmaceutical Association.

This work, aside from its general value as a contribution to elegant pharmacy, has a special interest to us on account of its origin in a concerted movement between the pharmacists of Brooklyn and New York to harmonize the great variety of elixirs, syrups, emulsions, etc., etc., with which different manufacturers were confusing the physician, as well as compelling the pharmacist to fill his shelves with numbers of preparations, the most essential difference in which was the name of the manufacturer or the trade-mark.

This resulted in the New York and Brooklyn Formulary, which was issued in 1884, and has now received not only the indorsement of but has been issued much enlarged by the National Association.

We cordially recommend it to our readers as an authoritative standard in prescribing unofficial preparations.

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 4.

BROOKLYN, N. Y., APRIL, 1889.

WHOLE No. 16

ORIGINAL ARTICLES.

SOME REMARKS ON THE PRINCIPLES OF OPERATIVE SURGERY.

BY GEORGE WACKERHAGEN, M.D., BROOKLYN.

Read before the Surgical Society, January 17th, 1889.

The principles of operative surgery may be summed up in the following order:

First.—The feasibility of the operation as regards real benefit to the patient.

Second.—Absolute cleanliness, to be realized only by the employment of antiseptics.

Third.—Simplicity and carefulness, with a systematized method of operating.

The feasibility of the operation as regards real benefit to the patient.—The science and art of surgery are so progressive that it is impossible, at the present time, to lay down any absolute rules as to the extent to which one may venture in the performance of the more difficult capital operations. Almost every case is a law unto itself, and has its own special attending circumstances which must guide us in forming a definite opinion.

Notwithstanding all this, it appears to me that discussion is still in order as to the propriety of continuing to perform operations which are

hazardous to the life of the patient, and yet do not, even when successful in immediate results, sufficiently prolong life. In some instances, however, an operation may be performed when there is grave danger that the life of the patient may be sacrificed.

First—In cases where it is absolutely necessary that an attempt should be made to prolong life for a short period, in order that the patient may be enabled to accomplish some important act for the benefit of those dependent on him, when the surgeon is of the opinion that without an operation the patient will die before the act can be completed.

Second.—For the alleviation of intense suffering, although it is most probable that the operation will in no way contribute to prolong life.

On the other hand, it appears to me that operations which endanger the life of the patient, and yet do not offer any hope of ultimate recovery, should not be performed, *e. g.*: *First*.—In cases of symptoms of tumor of the brain, in which there is pronounced malignant invasion of other vital organs. *Second*.—In cases where the result of the operation would so seriously interfere with physiological functions that life would become a burden and death ultimately result.

The consent, or even the request of a patient, does not justify the surgeon in placing life in jeopardy, when, in his judgment, there is no probability of a reasonable extension of life. These objections are not intended to refer to exploratory laparotomies.

Absolute cleanliness, to be realized only by the employment of antiseptics.—With but few exceptions among surgeons, the absolute necessity of a strict antiseptic method in operations is now not questioned. As all are familiar with the fact that the introduction of antiseptic principles enables us to invade localities of the body hitherto considered inaccessible, and he who does not observe these rules in the treatment of small or large wounds is justly deserving of censure.

It has been my endeavor, while being most rigorous in aseptic precautions, to simplify details, for the purpose of saving time and trouble in preparation. For this reason I have established a regular routine in preparation, and believe that my former method has been very much simplified.

Instead of a disconnected assemblage of antiseptic appliances, I have made a canvas case divided into ten compartments, which is here presented for your inspection. The first compartment contains iodoform gauze; the second, sublimate gauze; the third, drainage tubes and sponges; the fourth, glass irrigation tubes; the fifth, bandages; the sixth, Esmarch's bandages, safety pins, bichloride tablets, transfusion salt, and sol. cocaine; the seventh, hand brushes; the eighth,

carbolic acid and iodoformized ether; the ninth and tenth, two one-gallon irrigation bags. When not in use, the case can be rolled up; and, as it occupies a small space, it can be carried in a telescopic satchel thirteen inches long, eight inches wide, and seven inches high, and by the side of it may be carried the necessary ligatures in glass jars, and the rubber operating apron.

When a laparotomy is to be performed, there is a special case, suitably arranged for that purpose, which may be strapped to the general operating satchel. The instruments are generally put in the instrument pans, and carried in the telescopic satchel.

The ordinary process of preparation, in a private house, is as follows: The attendant is directed to procure two clean vessels, each holding five gallons of water, which is to be boiled. One-half of the quantity of water is allowed to cool and the other is kept boiling.

Second, to have in readiness:

One large table for dressings.

Two table-bowls for ligatures.

Two tin wash-basins.

Three earthen wash-bowls.

Two dozen towels.

One two-quart pitcher.

A large table suitable for operations.

Third.—The floor of the room which is to be used for the operation, if carpeted, is protected by some material which will prevent soiling.

Fourth.—The operating-table is then placed in position, and covered with quilts or blankets and a rubber cloth, over which is placed a white sheet.

Fifth.—The table for the dressings is put in the most convenient position, and also covered with a clean sheet which has been carbolicized.

Sixth.—The person in making these preparations must thoroughly scrub his hands with soap and water, especial attention being paid to the finger-nails.

Seventh.—All the vessels to be used during the operation are thoroughly cleaned and washed out with five per cent. solution of carbolic acid.

Eighth.—A solution of bichloride, 1-2000, is now prepared, in which the hands are occasionally immersed during the remainder of the preparations.

Ninth.—A sufficient number of towels are now soaked in a three per cent. solution of carbolic acid.

Tenth.—The instrument pans are now placed in lines on the

dressing-table, the instruments being immersed in three per-cent. carbolic acid solution. Behind the instruments are placed the ligatures and sutures, and behind them the canvas case.

Eleventh.—The irrigation-bags are hung in convenient locations—one filled with 1-2000 bichloride solution, the other with boiled water.

Twelfth.—The three earthen wash-basins are also filled with bichloride solution, 1-2000, for the operator and his assistants.

Though antiseptics are not at all times necessary in wounds when every possible effort toward absolute cleanliness has been carried out, yet their use is always a warrant of security when employed on the hands and instruments. When required in the wounds, I think it the best practice to use one which has been found to be actually a destroyer of septic germs such, for example, as the bichloride solution 1-2000, and then to wash it out with hot water or the boro-salicylic solution.

Assistants cannot be too conscientious, and should refuse to accept a call to an operation if they have been treating septic diseases. I well remember a case in which erysipelas occurred after an operation which I supposed had been strictly antiseptic.

I endeavored to trace its origin, and accused the assistants, but all denied having had any cases of erysipelas in a long time. After two or three weeks had elapsed, my first assistant acknowledged that he had been attending two cases of erysipelas a few days prior to the operation.

Simplicity and carefulness, with a systematized method of operating.—An operation should always be devoid of flourish. A systematic and careful surgeon will generally accomplish more work and have better results than one who is quick and nervous in his movements, however dexterous he may be.

The most important consideration is, How much can we simplify the operation and still have it effectual?

It is an excellent plan in important cases before commencing the operation, to carefully deliberate on each step of its performance, in order, if possible, to anticipate the difficulties which may arise. An operation cannot be neatly performed if there are too many or an insufficient number of assistants. The number usually required is four—one to administer the anæsthetic; one to assist the operator; one to take charge of instruments and dressings; and one to take charge of the irrigation and sponges. These assistants should always anticipate the wants of the operating surgeon.

In cases where there is danger of dividing important and deeply lying structures, it is preferable, in order to save time, to pinch up the skin and divide it with one stroke of the knife, the line of incision hav-

ing been traced on the skin. This is good practice when operating on the neck, in the axilla, in hernia and other abdominal operations; in short, in all localities where the skin is sufficiently loose.

It is remarkable how much may be more easily and safely accomplished with scissors after the skin has been incised; in dissecting out adherent tumors when they are in close proximity to important vessels and nerves. A new style of blunt pointed, curved-on-the-flat scissors is here shown. They are made by Messrs. Tiemann & Co. I think we should discard and combine instruments when possible. To this end very long needles can be used, which may be handled without a needle-holder. Samples of needles are here shown. Of course, the needle-holder cannot be dispensed with when it is necessary to secure an artery by deep ligation, or where sutures must be taken in small and deep cavities, or when the tissues are unusually tough.

In case of suture of intestines after enterectomy, I would suggest that the line of suture should be partly continuous and partly interrupted, for the reason that if all are continuous they would not be safe, and if all interrupted the operation is very much prolonged.

With regard to the position of the patient in laparotomy, I cannot too strongly praise the position adopted by Trendelenberg as I have so frequently witnessed its advantages when attending the operations by Prof. Lange of New York.

I would also present an instrument which I have had constructed for use as a probe and also as an aneurism needle.

Permit me to refer also to the use of Esmarch's bandage. The limb having been elevated, it should be applied by encircling the limb at a suitable distance above the point of operation, and not, as is usual, from the end of an extremity; for, by the latter method, the slight bleeding which enables us to find the vessels and ligate them before removing the bandage is prevented.

In conclusion, I would refer to the use of cocaine, which I have employed invariably with great satisfaction for several years in cases of internal urethrotomy, and also in a case of external urethrotomy, as well as in searching for a wounded artery, when it was not expedient to administer chloroform or ether.

DISCUSSION.

Dr. ROCKWELL.—I suppose I am called upon because I am also interested in the rapid and simple execution of antiseptic work, and especially the getting into small compass those articles which are absolutely essential to its proper performance.

The practical difference between my method and that of the reader of the paper is in the arrangement of sponges and the iodoform gauze.

It seems to me, if there is anything in antiseptics at all, it should be rigidly carried out; and, while I am aware that many follow Tait's plan of keeping sponges in a dry state, I think the greater safety lies in keeping them thoroughly submerged in a reliable aseptic fluid until ready for use; and for that reason I should object to the author's plan, and the same objection would apply to the gauze and other material. Thus exposed they are likely to absorb germs that might prove disastrous. The criticism is theoretical, but I think experience would sustain the position which I take.

Another point which occurs to me is that of the use of interrupted and continued suture in enterorrhaphy. This idea was first promulgated by Smith, and he makes the remark quoted by the reader, that not only is time saved, but additional safety is secured by using first interrupted and then continued suture. I have carried out this plan myself in two cases of wounded intestine, and, on post-mortem inspection of the specimen, showed that the result was perfect. The patient died on the eighth day, the intestinal wound having healed in the meantime.

I think that all of us should strive for simplicity and neatness, not only in detail, but in preparation of our material, and some such plan as that advised by Dr. Wackerhagen, Dr. Fowler, or myself will meet all the needs of ordinary private practice.

Dr. FOWLER.—In the first place, I object to the general use of iodoform gauze, inasmuch as it is used, quite frequently, unnecessarily, and anything that is unnecessary in antiseptic work is likely to prove harmful. If the operation is conducted antiseptically, iodoform, or any other permanent antiseptic, is entirely unnecessary.

I object to the use of sponges for the reason that one knows very little about the previous history of the sponge before it comes to our hands. They are exceedingly difficult to sterilize, and for this reason, as well as on other accounts, I have discarded the use of them entirely.

If iodoform gauze be done away with, simple sterilized cheese cloth or butter cloth substituted, and artificial sponges made of the same material made use of, the contents of such a dressing case will be very much simplified. A half dozen thicknesses of this hygroscopic cheese cloth, forming a square of from three to six inches, with a stitch placed through the centre to hold them together, will answer all the uses of sponges; they can be packed closely in one of the screw-cap bottles now so commonly used by pharmacists: A sufficient number of these artificial sponges can be placed in one of these screw-capped bottles for any ordinary operation; these can be duplicated at any time and at a trifling cost.

In my own practice I do not carry iodoform or any other permanent antiseptic gauze. My roller bandages are made of hygroscopic cheese cloth, and, after wetting a piece of this the size required in an antiseptic solution, I apply iodoform with an iodoform dredging box, or an ordinary salt sprinkler or "shaker" will answer the purpose admirably. This procedure is mainly intended for cases already septic. In aseptic cases, I place next to the wound a piece of the sterilized cheese cloth, cut off from the end of one of my roller bandages, and wring it as dry as possible after wetting it in the antiseptic fluid employed. Over this is placed another installment of the same material, again unrolled from a roller and crumpled so as to make a sort of cushion-shaped dressing. This does away with the necessity of duplicating dressing materials, for, as you will see, thus far I have made everything from my roller bandages made of sterilized and hygroscopic cheese cloth. A few turns of the latter will hold the former in position, and my dressing is complete. In case I need any further absorbent material, or any "backing," as it is called, to my dressings, I make use of a "paper wool," which is simply fine absorbent manilla paper cut in strips about one-sixteenth of an inch wide and "crinkled" or crumpled. No special process is required to produce the latter crumpled or crinkled state, for the reason that when it is wet with bichloride solution, for the purpose of sterilizing it, upon drying and being shaken out it is found to be ready for use. For septic cases, hydronaphthol can be incorporated in this paper wool by wetting it with an emulsion of the latter. Upon drying, the fine crystals of hydronaphthol, particularly if the solution has had a trifle of glycerine added to it, will remain clinging to the paper wool.

On general principles I strongly object to using anything in the shape of antiseptic dressing materials prepared by the manufacturer. I believe it was Mr. Potter, of Texas, who said he did not propose to risk his life upon the chance carefulness of a New England factory girl. He referred to the fact that he always loaded his revolver in the old-fashioned manner, with cap and ball, instead of a manufactured cartridge. Sanitarily, I do not care to risk the life of my patient on the chance knowledge of the necessity of care possessed by an ordinary factory operative; for which reason I decline to use anything, as far as it is possible to avoid it, that has been made in a factory, unless it be something which I can sterilize myself, such as the hygroscopic cheese cloth before mentioned.

I would like to call attention to the advantages of the French and German lock for scissors over the form presented by Dr. Wackerhagen. The point I desire to make is that the latter are rather more difficult to clean, and that which is difficult to clean is always to be avoided in antiseptic work.

The needles shown are based upon an excellent principle. I have spent a good deal of time and money in devising needle forceps, and I find my thumb and index finger to be the "handiest" means of manipulating a needle, provided one of the latter of a proper length is to be had. I have often thought that a needle curved in two opposite directions, such as a post-mortem needle devised, I think, by Dr. Burge some years ago, could be modified so as to be of use as a surgical needle.

The preparations preliminary to the operation mentioned by Dr. Wackerhagen are exceedingly useful to follow as a sort of a routine; by means of it one is not likely to miss an important point if the routine is always carried out.

Dr. WIGHT.—May I ask Dr. Fowler to make one correction; the post-mortem needle to which he refers was jointly invented by Dr. Burge and Dr. Wight; Dr. Wight is entitled to fully half the credit of that needle.

Dr. PILCHER.—I think, Mr. President, that we will all agree in the general principles that should govern us in operative work as they have been laid down by the reader of the evening.

It seems to me the plan of preparation presented to us has its merits, and is likely to be of value in accomplishing the purposes which have been described by the deviser of them. And with reference to the desirability of adopting a fixed programme for work, it certainly seems to me a wise thing to do. I have always thought I would do it, that I would have a programme made out, but I have never got around to it. I don't know as I can do any better than to adopt Dr. Wackerhagen's programme outright, I suppose that is what he has presented it for, that we may use it if we choose to.

With regard to such matters, however, different men in seeking the same end are sure to take different ways, so that we are likely to vary in the minutiae or in the detail of our work. The gentlemen who have discussed the methods presented by Dr. Wackerhagen this evening have suggested their own ideas, and doubtless they will reach ends as desirable as those which are reached by Dr. Wackerhagen in his method. For myself, neither the method of Dr. Wackerhagen or Dr. Rockwell or Dr. Fowler will do. At one of the meetings of this Society last year this subject was brought up somewhat also, and I then became enthused with the idea of getting up a ready case, and I don't know but what I interviewed the Chairman on the subject of what he was doing; I know I spent a profitable hour with Dr. Rockwell and Dr. Fowler examining their emergency bags, and I thought I was going to work to have a perfect case, but that is about as far as I have been able to get. I still do my work in a very desultory way, pile my

things into my bag and start off. The furthest I have been able to get along is to accumulate half a dozen ice-cream boxes, which are handy, by means of which I pretty nearly accomplish all I want to do in the way of preparation for my operative work; they are square tin boxes with a top that fits on pretty snugly and takes off easily. I can pack in them some prepared absorbent materials of various kinds, and odds and ends of any kind, and I can throw them into my bag with the certainty of finding things pretty well arranged for me, and easily gotten at when I get to the place where I wish to use them.

I don't like rubber cloth; I don't like to have it about in an operation I am particular about, unless it plays a very secondary part and is covered up by something else. I think it has been abundantly proved that a recently laundried sheet or pillow case or towel is pretty reliably aseptic, while a rubber sheet, whether it has ever been used or not, is a very unreliable thing in that particular.

If it has never been used before, it has nevertheless passed through all the uncertainties of the trade, which have been referred to by Dr. Fowler; if it has ever been used there is a probability that it has not been properly cleansed; when it seems desirable to use it for the purpose of preventing the clothing of the patient or bedding or things of that sort from becoming soiled by blood or by the dressing fluids that we use, it ought to be covered up by a clean sheet or a clean towel I am sure.

The same general objection may be made to the use of the rubber douche bags. I think very few surgeons nowadays are habitually operating under continued irrigation, and in general it seems to me that all the irrigation that is wanted in a wound can be obtained, as we operate in private work, by pouring from a pitcher, using water medicated or not, boiled water, hot or cold as the case demands. If we can do without a fountain bag I think it best to do so, although it is a very convenient thing.

What I have said has not been with the idea of criticizing the methods that have been suggested by Dr. Wackerhagen, but to illustrate my first statement that we are likely to reach our ends in different ways.

I continue to be so enamored of sawdust as a surgical dressing material that I can't get along without it. I can't think of going to an operation of any kind without carrying a few prepared sawdust pads along with me, and my ice-cream boxes are admirable as receptacles for them; and one or two sawdust pads will take the place of a very large amount of gauze, and I think are not so likely to have become accidentally impregnated with harmful dust. But whether that is so or not, I can recommend them as an exceedingly valuable agent among dressing materials.

Of course this talk over the subject does not attempt to exhaust the question of what is proper to use in dressing materials. At the same time I think it is desirable as far as possible to make our dressings acceptable to our patients; for that reason, if we can find anything that will take the place of iodoform it is desirable to do so, and I am inclined to accept the experience of many others, together with some experience of my own, that in zinc and bismuth we have agents often as effective as antiseptic agents as iodoform, while they are much more agreeable both to operator and those operated upon, while as regards their agreeableness to those who have to do with the operatee there is no question at all.

Dr. RAND.—In regard to the rubber sheet I have long felt the same as Dr. Pilcher. After a sheet has been used a few times, and lost its smooth surface, it is impossible to thoroughly cleanse it, and it should be destroyed.

While the majority present seem to disapprove of sponges, it seems to me that in certain operations it is well-nigh impossible to get along nicely without them. I have never found anything to quite take their place where there is copious hæmorrhage, in operations involving deep cavities.

In regard to iodoform, some doubt exists as to its antiseptic qualities. Boric acid answers well as a dusting powder. It is as good as, if not a better antiseptic than zinc or bismuth, and can be more easily applied to wounds from a dusting-box.

Dr. RICHARDSON.—I think the paper has been pretty thoroughly discussed. I simply want to endorse the opinion as expressed by Dr. Fowler in regard to the use of sponges. For a number of years I have used only the absorbent cotton and absorbent gauze. I know Prof. Billroth in his practice in the hospital in Vienna for ten years has entirely ignored sponges, and I think in attempting to carry out the principles of antiseptic surgery it is a wise thing to ignore them as far possible, and use these substitutes which have been mentioned.

Dr. ROCKWELL.—I would like to ask for information, for I feel with Dr. Rand that sponge has its field and am not ready to throw it away quite yet, whether tufta does absorb as rapidly as sponge and can be used as well in abdominal operations.

Dr. FOWLER.—I think in abdominal operations in the Methodist Hospital last year sponges were used once only. Operations for intestinal obstruction and various other purpose for which the abdomen is opened have been performed, and I do not remember that at any time we have even thought of the necessity of a sponge. We make a half a dozen or more thicknesses of gauze and stitch them together, and that answers the purpose of the sponge so commonly used. Smaller

"toepfe" are used in the hospital by making a little bag from gauze and filling it with waste cuttings from the hygroscopic cheese cloth. They are cheap enough to throw away when one is through with them. In regard to the supposed greater facility for absorbing the blood which obscures the operating field claimed for the natural sponge as compared with the artificial sponge, I may say that we occasionally get a very bloody operation, and we have never yet wished for sponges; we have always succeeded in keeping our field clear with the ordinary gauze.

I remember Dr. Delatour had an operation where some branches of the internal maxillary were wounded and where it was very difficult to sponge rapidly on account of the depth of the wound, and yet from my recollection of some cases in which the sponge was used in my own experience previously, my belief is that he succeeded in keeping the operating field as clear as it could possibly have been done with the natural sponge.

Dr. BOGART.—Notwithstanding the discouraging reports that have come to us from those who have experimented with iodoform as to its antiseptic qualities, I have not seen a good substitute for it in operative work. In most cases we don't need a powder at all if we have a good absorbent next the wound. Such, for example, as the sawdust pad, which, so far as I have been able to observe, is one of the best. I think sometimes it is a bad thing to put two or three layers of gauze between the main absorbent and the wound. I have seen cases where the primary wound secretions taken up by the gauze have dried and with it formed an impermeable covering, preventing the escape of the later discharges. But, while I think we can get along just as well by omitting the drying powder in ordinary cases, there are others, such as operations which involve the lower portion of the rectum and large open wounds, where an antiseptic powder is of service in rendering innocuous the discharges taken up by the packing of the wound.

At the M. E. Hospital we have used a great deal of bismuth subnitrate lately, and I am obliged to confess that I am not so well pleased with it as my chief. It seems to act mechanically in obstructing the healing process, and where the surfaces of large cavities which had been previously packed with bismuth gauze have adhered together afterwards, the union has broken down, and we have found the bismuth apparently just as it was when it was put there—a foreign body.

Dr. Rand's suggestion as to boric acid seems to me to be a good one. I should have more hope in that direction. The objections to iodoform are its odor and the fact that certain persons seem to be very susceptible to its poisonous properties. During the past year I have seen a number of mild cases of poisoning resulting from its use in rectal surgery.

I, too, have been impressed with the advantage of sewing without forceps whenever possible; and for this purpose I think the long, straight Haggadorn needle, whose cut section would be an oblong and whose point only is sharp, answers better than either of the needles that we have seen here this evening. With a needle which has been sharpened to a considerable distance from the point, you are apt to cut your fingers. This is not true of the Haggadorn needle. That which I use is about three inches long.

Dr. WIGHT.—I have been very greatly pleased at the tendency towards dropping the sponge, for many years ago I only used them occasionally. I admit their desirability in many ways, and I use them; but, I never use them twice, and never use them without they are thoroughly prepared, boiled, by a skilled party, and I keep them immersed until I use them, and then throw them away. In hospital practice they do boil them pretty thoroughly, and then I think they are safe. Turkish towels make an admirable substitute for sponges. I think the question of carelessness with reference to sponges lies at the root of a great deal of our trouble; if you can get a clean sponge it is all right, but the question is to get a clean sponge. Many of our patients have lost their lives undoubtedly through the use of unfit sponges, when the operators have thought that they were very careful. They are not above suspicion unless they are most carefully dealt with.

As to iodoform, I use it as a drying powder on wounds and for arresting the oozing of blood. I did use iodoform and coffee for quite a long while, but I got tired of it; I was afraid of iodoform, but I got over that. I do not care for the smell of it at all; anything that is objectional without mischief, that I don't care anything about.

I am very fond of a good needle forceps; I don't care to prick my fingers and cut them. One of the best forceps is the Russian. When you squeeze it, with the clamp down, it will drop off and leave it free. I have invented two or three needle forceps, and they were failures.

I had Tieman make me some very long, curved needles, smaller than those in the market and longer; for certain purposes they work admirably. You cannot use them without needle forceps, and guide them right. Let others prick their fingers; I prefer a good, strong pair of needle forceps.

I would like to say a word with reference to douching. When I apply the douche continuously, I find my patient does not do well, and so I go back to the simplest plan possible, just aiming at the simplest surgery I can with occasional douching, and I prefer that to continual wetting. I think you can change the tissues by continuous action of the douche, so that they won't heal even by granulation. I am inclined to go back to the simplest principles more and more in many ways.

But I would like to call attention to another matter. The fact that carbolic acid is not an acid at all but an alcohol, for it is constructed upon the same elementary plan that ethyl alcohol is exactly.

Dr. WACKERHAGEN —I should like to say a word or two in defense of this end of the canvas case. In reply to Dr. Rockwell, I would state that the sublimate, the iodoform gauze, and the sponges are not exposed to dust, as they are covered by the lateral and anterior muslin flaps, and when not in use the case is rolled up and kept in the telescopic satchel. I would also state that the case was first boiled and then immersed in a 1 to 500 sublimate solution before it was put in use.

When preparing for an operation, this case is always placed on a clean carbolized sheet, and not put on an ordinary table as you see it here.

With regard to irrigating bags, I would say that it seems to me that they are much more convenient than pouring water from a pitcher on the wound.

As to the long needles presented, I will state that they are not half curved, but only curved near the point, and they can be pushed through the tissue without difficulty and without the aid of a needle-holder.

In reply to Dr. Fowler, I would state that I did not refer to the use of iodoform powder on wounds, as I have also generally discarded it; but I do use the iodoformized ether for the purpose of cleansing the surface or field of operation. I also use the sublimate solution for this purpose.

There can be no objection to the use of sponges when we know that they are absolutely clean, and I know that these sponges are as aseptic as any preparation of gauze; and, as far as my experience goes, they are much to be preferred to any gauze substitutes in keeping the field of operation free from blood accumulation.

I acknowledge the defective lock in those scissors. In explanation I would say that they were manufactured some years ago, the change at the point being only recently made by Messrs. Tieman & Co. for the purpose of illustrating this improvement. New ones should have the improved lock.

SPECIALISTS AND THE GENERAL PRACTITIONER.

BY WILLARD P. BEACH, M.D., BROOKLYN.

We believe it will be conceded by all concerned that the struggle for a livelihood among the younger members of the medical profession is becoming more trying and severe every year, and that it is a serious daily question with many physicians of a few years' practice how to maintain an honorable standing before the eyes of their brethren, and at the same time keep their financial accounts even and themselves and families comfortably provided with this world's goods.

This state of affairs normally and naturally exists to a certain degree, as in all other professions, as well as in the trades, owing to a healthful and necessary competition. There are, however, certain factors to be considered, which seem to us to account for a great deal of uncalled-for struggling and deprivation universally experienced by the young doctor. It is for the purpose of discussing two of the more important of these factors that this article is written. They are :

First.—The inefficient acquirements, both theoretical and practical, of those starting in the practice of medicine.

Second.—Too many specialists, and too many specialties.

A young man, having tried his fortune at various occupations, and making but little progress, or perhaps having been brought up on a farm, where the work is laborious and prolonged, bethinks his lot a hard one ; and having heard of Doctor A., who started from a position in life as far down in the scale as his own, who is progressing wonderfully well, starts his career in a medical school, without any special intellectual preparation or inquiry as to peculiar adaptability, and is soon made a full-fledged M.D.

His means being limited, he selects the institution from which he feels he will be the surest to graduate in the shortest space of time. This of course stimulates the medical schools, which are for the most part not endowed colleges, but compelled to rely on the funds of the students for support, to offer extra inducements to those about to study medicine, and here comes in the very hurtful competition between medical seats of learning. The result is, in too many instances, that the new doctor puts out his sign, and awaits his first case with more or less lack of self-confidence and fear. He has probably never felt a pulse or taken a temperature, and most of his prescriptions are fanciful and often composed of incompatible ingredients.

Sooner or later a simple case calls for treatment, perhaps, in fact almost certainly, it can be classed in one of the numerous specialties ; and the young man, and very often some of the older ones too, never

having seen a case like it before, becomes alarmed, and at once sends it to a specialist.

And thus the general practitioner becomes the feeding reservoir to keep the offices of the specialists filled with patients, and their pockets distended with money which is willingly paid in large fees, while the family doctor just ekes out an economical existence, working night and day for miserably small pay.

It is here we wish to consider the second factor, namely: Too many specialties and too many specialists.

Dr. George Shrady said, in an article contained in the *New York Medical Record*, recently, that specialism was being overdone. We are decidedly of the same opinion.

What should constitute a specialist? He should be a man of mature mind, consequently one who has reached middle life at least, and who has had an extensive experience in general practice in all its phases; a man who has been a close student of nature and of his books, and who is naturally observing; one who, in the course of many years of general experience, has found himself intuitively drifting towards a special line of study, for which he has instinctively developed a particular liking.

Such men are few, and in demand. Their scope of observation will be broad and unbiased, and their diagnoses of special disease will be deduced from a proper comparison of all symptoms, both near and remote, and not limited to the narrow channel of their specialty, as is now so often the case.

Some time since, a gentleman complained of having a sore throat. He visited an eminent genito-urinary specialist, who diagnosed secondary syphilis, and ordered the mixed treatment, which afforded no relief. He was then referred to a neurologist, who located the trouble in the brain, and prescribed strychnia and galvanism, which caused no improvement. He then went to a laryngologist, who thought his complaint was catarrhal pharyngitis, and used astringents, which, according to the patient, aggravated the trouble. Finally he fell into the hands of a well-known general practitioner, who prescribed for an old-standing dyspepsia, which soon resulted in totally curing the throat. The above facts were narrated to us by a laryngologist of note, and are all vouched for.

Dr. E. S. McKee, of Cincinnati, O., says:

"I am a strong advocate of specialists, specialties, and special studies; but I do not believe in every new graduate rushing off to Europe, studying some specialty, and returning in three months a full-fledged specialist. He should serve his term in general practice first." The Doctor then cites some amusing cases of sterility, in which the

poor women had been doctored by gynæcologists and neurologists till hope had almost fled, when they went to him and he found the trouble to be with the husbands and not with the women.

When the day comes that shall find such specialists as advocated above, it will not be necessary for them to get up a paper on some subject in their line, read it before a medical society, and then have reprints sent to all the doctors far and near, with their addresses plainly appended, or to change their residence and send cards to brother physicians announcing their removal, such as one recently received by us, stating that "Dr —, of — street, New York, having removed to — street, was ready to treat all female complaints." To increase the already overfilled list of medical schools for personal aggrandizement, to run private hospitals or health asylums, or any of the numerous dodges resorted to for individual advertisement. They will be known and read of all medical men as wise and helpful counselors, who can really assist us in our extremity, and not consult to merely satisfy the friends of the patient.

But we would maintain that all the commoner maladies, even belonging to the specialties, should be treated by the general practitioner, and the specialist called in only in the very obscure and ill-defined cases.

The solution of this whole matter we believe to be in raising the standard of licentiates for theoretical knowledge, and requiring a hospital experience for every practitioner in the State.

INTRODUCTION TO A DISCUSSION ON EMPYEMA AT THE ST. CATHARINE'S HOSPITAL, SEPT. 11, 1888.

BY JAMES L. KORTRIGHT, M.D.

Gentlemen: Empyema, a collection of pus in either or both pleural cavities, with pneumothorax or without it, is our subject of study for this evening.

The history of empyema is the history of its treatment. The striking picture of pus discharging through the chest wall could not fail to attract the attention of the ancients; and even as far back as the time of Hippocrates, it was proposed to assist draining of the matter by boring into the chest with a hot iron. The rib was perforated rather than the interspace, that the opening might be firmly plugged and that the fluid should not run off too rapidly. Other surgeons of this time cut through the intercostal muscles with caustic or knife and

broke through the pleura with blunt instruments. Galen devised the pyulcon, I presume an instrument shaped like a trocar, and with it he drew off pus from the pleura through an opening made through the sternum. At least, so it is stated. During the Middle Ages operative treatment of empyema was in great measure abandoned, and no advances were made in the direction of rational and successful treatment. With the revival of learning, the surgical treatment of empyema again came under the notice of medical men and the pyulcon was revived. Tapping was preferred to incision; and to trocars were attached empty bladders and suction pumps of various kinds.

The rational study and treatment of cases of empyema began with Laennec. Hippocrates might shake his cases of pneumo-pyothorax and hear his succussion sound, but it was not until Laennec obtained his auscultatory skill that exact diagnosis became possible. The invention of the grooved exploring needle by Davis of London, in 1826, and the demonstration of the safety of its use, and the invention of the Reybard's trocar in 1837, made verification of the auscultatory diagnosis possible. America can claim the honor of the greatest advance in the line of treatment. To make the trocar canula very small, and to substitute suction from without, for pressure from within, was the idea and the act of Morris Wyman of Mass., in 1850. This important advance was brought before the profession by Professor Bowditch of Boston. But the operation by suction never became popular until Dieulafoy perfected the aspirator in 1869. The cutting operation came into renewed favor with the advent of Listerism, and the growing experience of surgeons has taught them the wisdom and the safety of boldly opening the chest, and in proper cases of treating the pleura like an open wound.

Empyema may occur at any age, in any climate, and at any time of the year. It is most common in temperate latitudes, in damp regions, in winter, in unhygienic surroundings, in males, in childhood and among those who are exposed to privation by reason of their labor, their poverty, or their excesses. In a series of 44 cases, 29 occurred between the first and tenth year, 7 between the tenth and twentieth year, and 8 between the twentieth and thirtieth year.

Tubercular individuals are especially susceptible to the disease and furnish 34 per cent. of the cases. Empyema may be localized between the lung and diaphragm, between the lung and chest wall, between the lobes of the lung, or it may be generalized. It may be single or double, or associated with pus in the peritonæum, pericardium and cerebral meninges. It may be due to exposure to cold, to discharge into the pleura of an abscess in the lung, mediastinum, chest wall, or liver. A gastric ulcer has been known to perforate into the pleura and

set up empyema. A cavity in the lung may rupture into the pleura with the same result. Stab wounds and gunshot wounds of the chest, fracture or caries of the ribs, sarcomatous or carcinomatous growths in the chest, lung, pleura or mediastinum have all proved causes. It is regularly secondary to measles, scarlatina, variola, pyæmia, septicæmia, typhus and typhoid fevers and chronic Bright's disease. Empyema may supervene in the course of pleurisy with effusion; and, lastly, it may be idiopathic.

Empyema presents a varied clinical picture. There are no pathognomonic symptoms. The physical and rational signs of pleurisy with effusion, with persistent high temperature and sweating, or irregular chills, or œdema of the chest wall of the affected side and clubbing of the fingers and toes, should lead one to suspect the presence of pus in the effusion. The aspirator will verify the diagnosis. Œdema of the chest wall should always be sought for; when slightly marked, it will be best found under the arm, high up toward the axilla.

Empyema in a small number of acute cases in childhood, terminates by recession of the inflammation and resorption of the purulent effusion. In the great majority of cases, the end is perforation of the chest wall or of the lung or bronchus, or where no perforation occurs, death takes place from typhoid condition or septicæmia or tubercular infection. When perforation occurs into lung or bronchus, rapid recovery may ensue or death may take place suddenly from the large amount of pus breaking into the bronchi, or from tuberculosis, or septicæmia. If the abscess perforate externally, the seat of election is the fifth intercostal space in the nipple line, or in childhood as high as the second intercostal space in front. A case of chronic empyema may die from syncope; and in the acute stages, these patients may die from œdema of the other lung, heart failure, deficient aeration of the blood, or hyperpyrexia.

The prognosis is not good. The most favorable cases are those occurring in young children free from constitutional taint, where perforation occurs externally or into the lung substance. This statement, of course, refers to cases left to themselves. The disease may exist for a few days only, or the histories of the cases may extend over many years. After recovery, deformity of the chest is the rule, although in young and growing children it may disappear with proper treatment.

The indications for treatment are threefold: first, to sustain the patient; second, to remove the pus; third, to close the pleural cavity and re-expand the lung.

First.—In the acute stages it is necessary to give liquid nourishment and stimulants, to reduce temperature, to quiet pain, to sustain the heart. In the chronic stages or after operation, it is necessary to nourish these patients to the highest degree.

Second—Two operations are proposed and performed to remove pus—aspiration and incision. It is not wise to wait for perforation of the lung or pointing in the chest wall. Aspiration is advised for purposes of diagnosis, to relieve the dyspnoea, the strain upon the heart from pressure, and the congestion of the other lung. In children, after this operation, the pus will frequently not return. When after an aspiration the pus reaccumulates slowly, and especially is more serous in character than at first, it is better to repeat the aspiration, in the hope that a cure may be thus effected. The needle should be entered in the axilla at the sixth interspace, or in the eighth interspace beneath the scapula. Incision is contraindicated in cases of chronic phthisis, where the purulent effusion is not causing much inconvenience; in cases where the effusion depends upon the presence of sarcomatous or carcinomatous growths; in cases where a perforation has occurred into a large bronchus; in cases in which the pus is being coughed up without untoward symptoms. When perforation has taken place externally, it is better to make the opening free.

The usual site for the incision is in the scapular or posterior axillary line at the eighth interspace. Good results have been obtained by operating in the sixth space in the axilla and in the fifth space beneath the nipple. One English surgeon opens the chests of his child patients in the second interspace in front. All operators are agreed that the opening should not be at the extreme bottom of the chest, because in the subsequent partial collapse of the chest the lowest spaces are soon covered by the ascending diaphragm. The *modus operandi* is simple. The different layers are cut through, one after the other, until the pleura is reached. When bleeding has ceased, the pleura and superimposed layers of fibrin are broken through with the handle of a scalpel and the pus evacuated. The claim that two incisions, with a drainage tube passed from one to the other, furnish a more thorough drainage of the chest, has not been substantiated by experience. It is impossible to prevent the entrance of air after incision. It is not proven that the entrance of air freed from germs is harmful. Perflation, pumping air into the chest, has been performed with benefit in a case of pyopneumothorax. It has been proposed to replace the pus as it flows away, by antiseptic solutions. Very ingenious apparatus has been designed for this purpose, but its use has not proved of much practical benefit. A large incision is better than a small one. For two thousand years the reverse idea held sway, but modern experience has proved its falsity. Unless the lung expand very promptly indeed, it is better to wash out the cavity. Lotions of carbolic acid, thymol, boric acid, iodine, chlorinated lime or soda, and salicylic acid are useful. In this way, fetor is corrected, suppuration

diminished, and healing promoted. Drainage tubes should be frequently renewed, lest they become brittle and fall into the thorax.

Strapping the chest and the application of a firm bandage, hasten the cure and are grateful to the patient.

Third.—Old cases of chronic empyema require more than a simple incision. Something is needed to cause the chest wall to contract and meet the non-expanding or partially expanding lung. For this purpose, portions of one or more ribs are removed beneath their periosteum. Some radical surgeons advise resection of the rib in every case, and one surgeon uniformly resects enough to allow the introduction of the hand except the thumb into the pleural cavity. With his hand he breaks up all adhesions and removes all fibrin. Experience does not prove such violent operative procedures necessary as a routine practice. The costal cartilages have been divided subcutaneously to aid the sinking of the chest. There seems to be a strife among surgeons as to who shall resect the largest number of ribs in empyema. At present the palm belongs to Rose and Duncan, who have each successfully resected portions of eight ribs. Every case should be treated upon its own merits, and the surgeon having ascertained the size of the cavity should endeavor to produce as good apposition between the costal and pulmonary pleura as possible. For this reason it is not necessary to compare the merits of multiple linear incisions, the long longitudinal incision, the anterior flap, the posterior flap, the combined flap, the curved incision, and the sigmoid incision. Too much attention can not be given to the expanding lung. These patients should endeavor to make the lung regain its former size as nearly as possible. Blowing upon a wind instrument, or through a small tube, forced voluntary inspirations in the erect posture, properly designed calisthenic exercises, are the lines along which we work for this end.

This paper was written to introduce a discussion on the subject of empyema. All references to the pathology of the disease and to its clinical history have been purposely omitted. Many interesting and important questions have been left untouched. Nothing has been said concerning pulsating empyema and phthisis. It was designed that these points and many more should be brought out in the discussion.

NOTES ON THE TREATMENT OF HÆMORRHAGE FROM LARGE VENOUS TRUNKS.

BY FRANK W. ROCKWELL, M.D.,

Surgeon to St. John's and St. Mary's Hospitals, Brooklyn.

Read before the Brooklyn Surgical Society, Thursday, January 3d, 1889.

During the last few years it has been the duty of the writer on several occasions to assume the grave responsibilities attending the removal of large and deeply attached tumors involving the neck, axilla, and groin; and it was during the preparation for some of the earlier of these operations that he had occasion to notice, in going over the literature of the treatment of wounded vessels, how very meagre and unsatisfactory was the formulated knowledge available in the treatment of hæmorrhage from large venous trunks. Most of the authorities dismissed the subject with directions to apply compression or elevation of the limb, reserving the ligature for cases not amenable to other treatment, and differing widely among themselves as to both the propriety and safety of using it at all. In fact it is only within the last two or three decades that anything like a general endorsement of the use of the ligature has prevailed, although its application has been known and practiced in the treatment of venous hæmorrhage since the days of Celsus. The great danger feared and urged against ligature was pyæmic or diffuse phlebitis, a danger shown by Gross and others to have been largely due to the imperfect methods and after-treatment then in vogue, and one which has almost disappeared with the improved dressings of the present day, the few exceptions to the rule of complete exemption being found in cases where for any reason the ligature is applied to coats of vessels already diseased or in persons of debilitated constitution. While, however, the danger arising from pyæmia may be practically discarded as influencing the use of the ligature, other results of its application are as much to be dreaded now as formerly; and it is to a rapid consideration of these conditions and their prevention that this paper is addressed.

As classified by S. W. Gross ("Wounds of Internal Jugular," *Am. Jour. Med. Sciences*, Jan. and April, 1867), they are œdema and gangrene of the limbs, secondary hæmorrhage, dropsical effusions, apoplexy, and cerebral softening. Of these the first three are most important, since they are responsible for nearly all the deaths following the application of ligatures to the trunks of veins coming from the extremities. The cause of these conditions, viz., the complete occlusion of the principal outlet for blood from the limb, and the consequent

accumulation and stagnation of this fluid in its tissues, was easy to comprehend; but its prevention was only made possible by the researches of H. Braun of Heidelberg and Braune of Leipsic, in regard to the anatomy and physiology of the femoral vein and its collateral branches, and the application of the results of the former's discoveries to practice by Langenbeck and others in the "prophylactic ligation" of the femoral and other arteries in wounds of their corresponding veins. The increased confidence given to operators by the successes achieved under antiseptic methods, also led about the same time to the revival of an old means for arresting hæmorrhage from incomplete wounds of large veins, now known as "lateral ligation."

It was the perusal of the papers of Professors Lewis E. Pilcher¹ and S. W. Gross (*loc. cit.*) during the search spoken above which first called the writer's attention to the possibility of averting the more serious of the dangers mentioned, by applying the method of lateral occlusion to wounds of large veins, and so preserving the return circulation of the limb. In fact the papers mentioned above are the only practical monographs on the subject in our own language, so far as the writer is aware, with the possible exception of a paper by Prof. E. Souchon, in the New Orleans Medical and Surgical Journal, vol. xv., p. 22, which is simply a *résumé* of the facts and conclusions arrived at in them.

As the application of the principles enunciated vary much with the character of the wound, the condition of the patient, and especially the region drained by the wounded vessel, it has seemed best to study each of the three principal regions by itself and apply to it the treatment most likely to result in a favorable termination in case of wounds of its chief vein. In favor of one of the methods now urged, lateral occlusion, which has up to the present time met with the all but universal condemnation of systematic writers on surgical topics, it is to be said that from the earliest times wounds in healthy veins have been recognized as peculiarly inclined to rapid and sound repair, and that many of the objections urged against its adoption by the earlier writers fail to have any influence with those who practice it in accordance with modern methods.

The only valid objection remaining is that of danger from secondary hæmorrhage due to slipping of the ligatures, a danger which can not occur if the plan adopted in one of the writer's cases be followed, and the ligature securely attached to the vein wall by transfixion of the

¹ Lateral Closure of Vein Wounds. *Annals of Surgery*, vol. viii., 1883, p. 85.

Arterial Ligation as a Prophylactic Measure, etc. *Annals of Surgery*, vol. iii., 1886, p. 105.

portion included in its loop. The great object gained in the preservation of the lumen of the vein, and the consequent nutrition of the limb, is so important compared with the slight risk run, even where the precaution alluded to is not taken, that where the animal ligature is used, and compression with aseptic gauze added as in the second case reported, the surgeon may practically disregard it.

Summing up, then, the resources at our command in case of wounds of large venous trunks, we have, in the order of their importance and the serious results of their application—

1st. Compression.

2d. Lateral occlusion, by ligature, suture, or forcipressure.

3d. Circular ligature, above and below the wound, with prophylactic ligation of corresponding artery; and,

4th. Circular ligature of the vein alone.

As the proper application of each method depends for its success on conditions which vary with the location and extent of the wound, it will be more practical to consider the technique appropriate to each in connection with the separate regions described.

FEMORAL REGION.

As the femoral region is the one upon which the greatest amount of study and clinical facts have been brought to bear, it will be first considered.

Experiments made by many observers, but especially by Braun, and given *in extenso* in the paper on "Prophylactic Arterial Ligation," by Prof. Pilcher, above alluded to, have proven it to be wholly impossible for the venous channels of the limb, when suddenly called upon by occlusion of the femoral vein, to supply a collateral circulation at all equal to the demands made upon them by the still active arterial supply. Œdema and consequent fatal gangrene have therefore been among the frequent results of ligation of this vessel practiced for wounds inflicted under normal conditions of circulation. Where, on the contrary, time for the establishment of a satisfactory collateral circulation has been afforded by the gradual supervention of the occlusion, as in the growth of tumors slowly pressing on the trunk vein, etc., the ligation has been much more successful; in fact cases are on record where, in the removal of growths from this region, excision of the vessel in its whole circumference has been practiced with no hæmorrhage at all. The practical inference from the above facts is obvious, and has been made and applied by Langenbeck and others. It is this: Whenever it becomes necessary to ligate the main vein of a limb, the supply of blood to that limb should be controlled by a ligature applied to the corresponding artery in such a way as to limit the

amount to a quantity just sufficient to maintain the nutrition of the parts. Applying this principle to the region under consideration, the proper place for the application of a ligature to the femoral artery would be below the origin of the profunda, the superficial femoral alone being occluded. A number of cases are on record in which, either from the situation of the injury or the fact that vein and artery were both injured at a higher point than the one selected, or from other reasons, the common femoral has been ligated with almost uniformly fatal results, gangrene being the most frequent cause of death.

The situation, too, of the wound in the vein has much to do with the result of the injury, the prognosis being obviously much more grave where its situation renders occlusion of the internal saphena inevitable.

It is for this reason that in all cases of wound of the femoral vein in which lateral ligation or suture, or even forcipressure, can be resorted to with a fair prospect of success, the surgeon is justified in running considerable risk (assuming that such risk is incurred even with all due precaution), in view of the certain dangers to which his patient will be submitted by occlusion of the vein or artery, or both at high levels. Lateral occlusion has been practiced on the femoral vein at least ten times with four recoveries. Of the six fatal cases, five were due to pyæmia. All the cases of this operation performed not only on this but on all other veins under full antiseptic precautions, have recovered, so far as the writer can find; and it is known that most of the early operations were practiced in the presence of conditions now known to be fatal to success, a fact which should have due weight in considering the apparently high mortality just given. In view, then, of the considerations just given, it would seem to be the duty of the surgeon, in all cases of wounds of the femoral vein whose size or character will admit of its application, to practice lateral occlusion, either by ligature, suture, or forcipressure. The second method being particularly applicable to vessels whose coats are thickened—as in a case treated by Lange, who sutured the femoral at the entrance of the saphena, as the vein walls were too dense to hold a ligature—should be applied in doubtful cases. If the injury to the vein is too extensive for lateral occlusion, the collateral circulation being reliable—as in wounds below the entrance of the saphena, or in those occurring during the removal of slowly growing tumors—ligature of the vein alone may be done with reasonable assurance of a successful result, since about seventy per cent. of recoveries have followed this practice.

If the vein is severed, or nearly so, above the entrance of the saphena, it should be ligated, and with it the superficial femoral artery.

In wounds involving both vessels, the vein should be closed if pos-

sible, by lateral suture, and the artery ligated by the usual method; though, if the wound be one involving the common trunk of both vessels, it is a serious question whether amputation at once at the level of the injury would not be a safer proceeding, in the few cases where time for such a choice existed. Where the injury occurs at a lower level, both vessels may be ligated, as in the cases reported by Pilcher and Walsham.

AXILLARY REGION.

In studying the axillary region, one is at once relieved from one of the great difficulties in dealing with inguinal wounds, since the circulation through the sub-scapular, circumflex, and other veins, makes a wound of the main trunk less liable to be followed by serious results when treated by ligature than a similar lesion in the lower extremity. Yet even here a ligature applied to the trunk at a higher level may be followed by gangrene or persistent œdema. In the great majority of cases treated in this way, no serious results have followed where the collateral vessels were undisturbed; where, however, these vessels have been previously obliterated by disease, or tied by the surgeon previous to the injury of the main trunk, œdema and gangrene have promptly followed complete occlusion of the root vein. Here, therefore, the rule should be, as in the femoral region, to maintain the patency of the principal vein by lateral ligature, suture, or forcipressure, with the view of avoiding the consequences liable to follow its sudden occlusion.

That this may be safely done HAS BEEN demonstrated in five cases reported by Pilcher, to which I desire to add the following:

CASE I.—During the spring of 1887, while extirpating a large mass of cancerous glands from the axilla of a woman of sixty, from whom I had just removed the left breast, I was so unfortunate as to wound the axillary vein just above a large branch, which from its position I took to be the subscapular vein. The hæmorrhage for a moment was alarming, but was promptly controlled by pressure. The edges of the wound, which were quite large, were seized with a pair of plain forceps, and a delicate needle armed with a catgut ligature passed through their edges, and tied firmly about the portion of the vessel raised by the forceps. The wound was irrigated, closed and drained as if the accident had not occurred, and a perfect recovery followed. This treatment would seem particularly applicable to incomplete wounds of the axillary vein which do not involve too great a portion of its circumference. Where, however, lateral occlusion cannot be practiced and ligation becomes necessary, the axillary artery should also be tied, this rule being particularly stringent if the vein wound be above the large branches, or they have been previously occluded.

These cases, according to Heath, are less apt to be followed by serious results than those in which the vein alone is ligated; and Boeckel thinks the hæmorrhage likely to cease from ligation of the artery alone, though arterio-venous aneurism will probably result, and remain to be dealt with afterwards.

In wounds of the subclavian vein the same principles would apply, though so far as I know they have been put in practice but twice. The first case occurred in 1884, the patient being a girl of twenty, who had suffered from an axillary abscess, during the dressing of which a deep vein was wounded by an attempt to insert a drainage tube. The hæmorrhage, restrained for a few hours by forcipressure, became uncontrollable, and Prof. Efremovsky, in whose service the patient was, ligated the subclavian artery. As the bleeding continued, the vein also was secured.

The arterial ligature came away on the 14th day, and the venous the 20th.

The arm was œdematous, and consecutive axillary abscess and acute osteomyelitis of the humerus complicated recovery, as did an attack of erysipelas, lasting two weeks. The thoracic artery and vein are believed to have been wounded. One year from the injury the patient was in condition to attend to her duties (*Annals of Surgery*, p. 429, Vol. IV., 1886). In the following year Prof. Pilcher ligated the axillary as a prophylactic measure in a case in which the internal jugular, subclavian, external jugular, transverse and suprascapular veins had been ligated during the removal of an axillary tumor. Union by first intention followed the operation. Considerable œdema persisted for a few weeks, but the patient ultimately entirely recovered.

CERVICAL REGION.

Wounds of the internal jugular vein have been left till the last on account of some peculiarities which render their treatment in many respects much simpler than those of the vessels already considered, the main distinction of course being the anatomical one, which is due to the extremely free collateral circulation afforded by the intracranial and superficial veins, rendering obliteration of these vessels or even of both internal jugulars a far less important matter than that of any other large venous trunk. We accordingly find that this vessel when wounded has been successfully treated by every method known to ancient or modern surgical art. It has been compressed digitally twice, the pressure being removed once in forty-eight and once in seventy-two hours, both cases recovering; while in six cases sponges were used with four recoveries. Nélaton plugged a large opening in its walls with a piece of agaric, his patient recovering, and it has been

the most frequent and successful recipient of the modern methods of venous occlusion. Yet even here a decided choice of agents remains to the surgeon. Successful as pressure in its various forms has been, there are decided objections to its employment. If properly made, respiration and deglutition are to a greater or less extent interfered with, and a degree of uncertainty attends its use, which must serve to limit its employment. Add to this that, according to the estimate of Souchon, based on an analysis of forty cases, its mortality is as great as that of the ligature (10 per cent.), and it is evident that as in the regions just considered, the choice must lie between lateral occlusion and ligation, since in wounds of the internal jugular, arterial ligation can find no place as a prophylactic measure.

And here, as in other regions, lateral occlusion would seem the simpler and safer proceeding, since of twenty cases reported to date, there were but three deaths, these occurring at an early period in the history of the operation from defective technique and materials used. To these cases I would add the following.

CASE II.—Miss K. was operated on by me on April 9, 1887, for the removal of a large mass of lymphatic glands occupying the superior carotid and posterior triangles of the neck, and complicated by a deep fistula running toward the trachea. Most of the mass had been removed and the internal jugular laid bare, when in attempting to divide the connection between the base of a large mass and the belly of the digastric muscle, a sharp arterial hæmorrhage occurred.

In seizing the bleeding vessel with a pair of Péan's forceps my assistant wounded the jugular, and a steady stream of venous blood began to well out of the wound. Repeated sponging and attempts to seize the bleeding point with forceps failed, but it was finally controlled by pressure above the wound, and a pair of Péan's forceps applied. Below these a catgut ligature was tied as in the preceding case, the artery (probably the lingual) secured, and the operation completed. No further hæmorrhage occurred, but on dressing the wound I determined to add moderate compression to the means already employed, and so only closed the upper portion, packing the region of the wounded vein with iodoform gauze. Over this naphthaline gauze and paper wool were applied.

April 13th (fourth day), the dressings were reapplied, and renewed four days after, when the gauze was removed and a small drain introduced, and the lips of the wound approximated by strapping. From this time until April 30th, the wound was dressed on alternate days, when it was nearly healed, and the patient soon after discharged.

In cases to which for any reason lateral ligature may not seem appropriate, the internal jugular may be ligated with but slight fear of

serious consequences, though the operation is necessarily a more severe one than the former. In one class of cases, however, both plans of treatment are inapplicable. I refer of course to wounds of the vessel at or near its exit from the jugular foramen, where, on account of the depth of the wound and its anatomical surroundings, neither circular nor lateral occlusion is possible.

Here but one plan, that of compression, remains. In such a case (a chisel stab), Jas. Bell having enlarged the external wound and tied the carotid with no effect on the hæmorrhage, plugged the wound with three aseptic sponges coated with iodoform, over which firm compression was made. One of these was removed on the 10th, one on the 17th day, and one after a month. The patient recovered. Bearing in mind this case and that of Nélaton quoted above, it would seem that even these injuries, once considered absolutely fatal, are to be added to the list of those amenable to modern methods of treatment of wounds.

As a natural corollary to the preceding facts, it will be proper to give the present status of the method known as lateral venous occlusion.

So far as the writer can ascertain, there have been up to the present time forty-three cases submitted to this procedure. They are as follows:

		<i>Recovered.</i>	<i>Died.</i>
Axillary.....	7	7	0
External jugular.....	1	1	0
Femoral.....	9	3	6
Internal jugular.	21	18	3
Sub-clavian.....	1	1	0
² Unknown.....	4	4	0
	43	34	9

giving a mortality of 22.3 per cent., the greatest number of deaths having occurred after wounds of the femoral, where, as we know from the facts shown in the earlier part of this paper, causes for such a result exist in the majority of cases. Even here the results of lateral occlusion compare brilliantly with those of any other method, and the condition of the limb as to its function and circulation is unimpaired.

ABDOMINAL AND PELVIC REGION.

If the principles enunciated in connection with the preceding groups of vessels are correct, it may not be improper to consider the possibility of their application to wounds of the large veins of the pelvis or abdomen.

² Reported by Mr. Walsham, in *Brit. Med. Jour.*, 1887.

As bearing upon this question, the following cases mentioned by Lidell in his article on "Wounds of Blood Vessels" (Int. Encyclopædia, Vol. III.,) are submitted.

A soldier whose vena cava had been pierced by an arrow just outside the pericardial sac, lived forty hours after the injury, though seriously injured in other ways.

Hennen mentions a case of wound of the vena azygos, the subject of which survived thirty-six hours.

Breschet records a similar case, where a duellist was wounded in the same region by a sword-thrust; the vessel having been cut in the curve it makes just previous to entering the vena cava. The wounded man lived three days after the reception of the injury.

As bearing more directly on the present inquiry, a single case is quoted in which a wound of the internal iliac vein did not prove fatal until the expiration of twenty-four hours.

While, therefore, as a rule, wounds of these great trunks must prove fatal within exceedingly short periods of time, occasional cases must occur in which a possibility of saving life will be afforded the surgeon who is resolute enough to attempt it. In such cases compression of the abdominal vessels by the finger, abdominal tourniquet, and the hand, or Trendelenburgh's rod in the rectum, will afford time to consider the best method of permanent relief in each case. A hope, however faint, may always be entertained that even in the worst cases a clot may be formed in the venous rent sufficient to permanently avert the hæmorrhage, while if the patient rally and time be afforded for a laparotomy, occlusion of the vein by the lateral-method may be done. Should prophylactic ligation be needed, the femoral artery should be tied, or compression to the aorta applied. In view of the recent achievements of abdominal surgery such procedures can be deemed neither visionary nor impracticable.

DISCUSSION.

Dr. PILCHER.—I have nothing new in the way of experience to add to what I have published some years ago, which has been referred to so kindly by the reader of the paper. Further reflection and observation have simply served to strengthen me in the conclusions which I expressed in that paper and which have been endorsed by the reader this evening.

There is a very interesting parallel between the surgery of veins and the surgery of the peritonæum, in the fears that were entertained by surgeons in dealing with them, and in the histological conditions which the lining membrane of the vein and the peritoneal surfaces present, and the tendency to repair which both these surfaces present

after injuries. And just as we may confidently expect very rapid adhesion of the peritoneal surfaces when they are brought together, so we may expect very rapid adhesion of the lining membrane of the veins if they are brought together and held in coaptation.

For that reason it is that in such a vessel as the internal jugular, with such a large amount of blood passing through it and such an amount of pressure bearing upon it, when a lateral pressure is made and this compression is removed after thirty-eight or forty-two hours, an adhesion takes place sufficiently strong to restore the function of the vessel.

These facts should make us the more ready to have recourse to lateral closure of all wounds in these large vein trunks which are suitable for that purpose, when by so doing we do not occlude the lumen of the tube.

I have no doubt but that if a minute search could be made, so as to bring out the experience of surgeons during the last ten years, a very much larger number of cases of lateral vein closure could be brought together than now appear in the literature. Since it has become an accepted method of treatment, and has very measurably been dismissed from consideration, many, many such experiences have been had, and they have not been recorded. And I am inclined to think that where evil consequences have resulted from such attempts it is much more likely that those would be put upon record nowadays than where they have healed kindly; and the fact that we have not had a record of many, if any, cases of disaster following the attempt at lateral closure, seems to me, in view of all the circumstances of the present time, to be one of the strongest evidences of its adoption.

The experience of mine in the matter of the ligation of the axillary artery, after the ligation of the subclavian and internal jugular veins, was a most happy one; and it may be interesting to report the fact that the patient upon whom that was performed remains strong and well up to the present, although in May four years will have elapsed since the operation was performed. It was done in May, 1885, and the operation not only included the removal of the axillary growth, but also a growth at the base of the neck above the clavicle. It was a recurrent carcinoma. There has been no further recurrence since that time, and she is now in good health. I hear from her from time to time, and know that if at any time any recurrence of the trouble should appear I would be promptly notified. It was in the late fall that I saw a member of the family, who reported at that time that she was well.

Dr. ROCKWELL.—May I ask Dr. Pilcher if the circulation has been restored in the lower arterial.

Dr. Pilcher.—Sufficiently for all purposes of nutrition. I cannot tell you positively whether the pulsation has returned in the radial or not.

Dr. WIGHT.—There is one point that seems to me to be of exceeding value, as a mere matter of interest, and also of practical interest, in the Doctor's paper. That relates to the simultaneous pressure, occlusion, or interruption of the arterial supply. That as I said at the beginning, is of very great interest to me. For instance, in interference with the circulation in the lower limb by damage or injury to the large venous trunks, that the limb is conserved more thoroughly and surely by a pressure ligation of the arterial supply or, rather, by ligation of the superficial femoral, cutting off some of the arterial blood. I can see the reason of that, and understand it, I think. But it occurred to me, why not, in the same way, if it is possible, and I don't know that it is or would be (in some cases I could say that it would not be possible), to make pressure for a limited time; and yet that might not reach the desired result, and if not, we should be left to ligate the superficial femoral.

I would say further only, not to delay, that if you can call such things beautiful, and it seems to me that when they are rightly put we can, this is most beautifully and wonderfully correlated with another subject, and that is the secondary hæmorrhage in some of these complex surgical cases—secondary hæmorrhage after a wounding of an axillary artery. It is related to it, but not perhaps in the way we would expect. I have long believed that in a good many cases of secondary hæmorrhage this might be the best thing for the patient.

This subject relates to something that has to be done at once, and is in a certain way related to that great subject of secondary hæmorrhage. I do not mean to discuss it to-night, but I mention the fact that it is in one way related to that important subject of wounds followed by secondary hæmorrhage from the axillary and from the femoral and other regions.

Dr. ROCKWELL.—I have nothing to add to the statements made in the paper, or to the discussion, except that I hardly agree with my friend, Dr. Pilcher, that the method of lateral occlusion is so accepted as to pass beyond the limit of discussion. The authorities with one exception, uniformly condemn it. And men who have had successful cases think them the result of a happy chance, not often to be expected. Thomas Bryant is the only standard author with whom I am familiar who speaks of it as a means to be habitually resorted to. I have been pretty thoroughly over the literature of the subject, and, as I say, Bryant is the only author who not only endorses it, but speaks of it as a means to be regularly employed. A larger number of cases

than those given in the paper has been reported; but as I was not able to verify them all, I could not use them in the paper. I only accepted cases which I have been over thoroughly myself, or on authority which I knew I could trust.

Dr. WIGHT.—I would like to suggest just at that point what has occurred to me, and it seems in a certain sense an important suggestion: It is, with such an operation as this, with a great many other matters that come up practically, it would be no doubt an important and delicate operation and would require skill, and it depends largely upon the individual operating as to how he does it. It does make a great difference how things are done in these cases. A skillful operator, one who had thought out the conditions of the work, would be much more likely to get a favorable result than one who had been prejudiced against it, or did not practice with skill in this, although he might be skillful in another matter. And it seems as though the personal factor must enter largely into it. I can very easily understand how one surgeon could approve and recommend such an operation and another could not.

Dr. WUNDERLICH.—I would say that amongst German surgeons, certainly, the lateral occlusion of veins is a general practice, and recommended by all authorities.

Dr. WIGHT.—Of course they practice antiseptically now, very thoroughly.

Dr. WUNDERLICH.—I don't believe that antiseptics have anything to do with the question.

Dr. ROCKWELL.—Many of the earlier operators seem to have operated in this way, but seem to have resorted to it in a haphazard sort of a way. Grillo ligated veins fifteen times, where no precaution was taken at all; the veins and arteries were simply tied together; and the results were favorable, showing that if the inner surfaces are only brought in apposition in healthy veins, favorable results may be expected.

Dr. WIGHT.—I have long practiced the ligation of veins, even before the more complete days of antiseptic surgery.

Dr. WUNDERLICH.—May not some of the fatal results following the simultaneous ligation of the femoral artery and vein for injuries be accounted for by the observation, that the loss of a moderate amount of blood from the femoral artery near its origin is more apt to cause alarming symptoms than the loss of the same amount of blood from other arteries of the leg or foot?

Dr. ROCKWELL.—I don't know that I am prepared to answer that. I think the main factor in the large mortality is the one brought out in the paper, the obstruction of the venous return to the limb.

NON-ALCOHOLIC CIRRHOSIS OF THE LIVER.

—BY D. MORRIS WOOLLEY, M.D., BROOKLYN, N. Y.

Read Before the Brooklyn Pathological Society, November, 1888.

About August 1st I was called to see a man twenty-five years of age suffering from pain and abdominal swelling. Percussion and palpation revealed the fact that there was considerable fluid in the peritoneal cavity. The appearance of the man and the symptoms he gave convinced me that the trouble was due to obstruction of the portal vein. However, I yielded to the opinion suggested by another physician, that it might be due to the heart, inasmuch as we got an aortic—and, as it was thought by him, a sound similar to a mitral, regurgitant murmur—and the impossibility of mapping out the liver. Accordingly, he pursued the plan suggested for the heart, giving infusion of digitalis, acetate of potassium, combined with pulv. jalap comp. He treated him for several days on this plan, and he apparently got better.

It was in the latter part of August that I was requested to take the entire charge of the case. I pursued nearly the same plan of treatment, but giving from five to ten minims of tr. strophanthus, substituting one-sixteenth gr. of elaterium for the jalap comp. Failing in this to remove the water, I was compelled to resort to an operative procedure, that of paracentesis. Having called in an assistant, I made a slight incision two inches below the umbilicus, into which I inserted an ordinary trocar and canula, letting out about ten quarts of the fluid. It was at this time I was more convinced that his primary trouble was due to the liver, and that the heart complication was secondary. He apparently got much better, so that he was able to go into the street. At the request of friends, in the latter part of September I got him into the hospital; but being dissatisfied and longing for home, he walked a distance of nearly two miles, and on the same day registered his vote. Two or three days after this I was again called to see him, and found that the fluid had accumulated more than before, and that he was in great agony. I administered morphine, elaterium, and tonics, but to no effect, and so was compelled to another operative procedure. I let out about four gallons of water. Great relief came, but then I saw that it was a question of a few days how long he could live. It was at this time I could distinctly outline the liver, and make out a diagnosis of cirrhosis. He continued in a weakened and delirious state, with slight convulsive seizures, for a few days, and then

died. With the assistance of Dr. Tetamore an autopsy was held, and the following pathological changes were noted: There were some old pleuritic adhesions, together with general congestion of the peritonæum, and results of chronic inflammations. There were no indications, I should say, as to any recent inflammation due to the operation. The omentum was contracted and adherent to the stomach, together with the transverse colon, which was greatly distended; in a word, everything seemed to be adherent. The liver is regularly hobnailed, and from its contraction you will see by examination it has lost its general contour, and while reduced to nearly one-half the normal size, is shaped very much like a large sized uterus. The microscopical specimen, for which I am indebted to Dr. Tieste, and here presented, will show you the cellular infiltration of the interlobular connective tissue, and the development of a more or less highly organized fibroid structure. There is also noted some fatty infiltration. The kidneys were only slightly congested, otherwise normal. The heart was a little contracted; its right side dilated and walls thin. The bicuspid valve greatly dilated, and one of the leaflets gone, otherwise apparently normal. The walls of the stomach thickened, hardened and indurated. The spleen was large and nearly three times its normal size. It showed fatty degeneration.

The remarkable feature about this case is the non-alcoholic history, and the fact that the man kept up so well with such marked pathological changes, with but slight loss of time. Perhaps in the last three years he had not been incapacitated from work more than four months. He gave a history three years ago with striking malarial manifestations, such as fever, chills, followed at times with jaundice, confining him to bed only a few weeks. Again, last winter, while working in a damp place, he contracted cold, and his wife says he was treated for kidney disease without any intimation as to liver trouble. He occasionally took a glass of whiskey and never drank more than a pint of beer in twenty-four hours. In fact, so far as I have been able to learn, never was seen intoxicated. So then the inference must be, for want of farther data, that a young man twenty-five years old must have had non-alcoholic cirrhosis.

For want of time I shall pass over the symptoms and dwell for a short while upon its etiology, prognosis and treatment. It is my belief that cirrhosis is no uncommon disease, and that it may be produced by anything which will keep the liver in a hyperæmic condition; such as long continued disorders of the gastro-intestinal tract—all of which may be produced by over-eating, excessive use of starchy food, sugar, alcohol, or malarial infection. Whether there is an inherent tendency in some persons more than others, like that of tuberculosis, may be a

question, but there is no ignoring the fact that malaria does frequently produce it, as recorded by Dr. Lancereaux, of the Hôpital de la Pitié, of Paris, and many others. Lancereaux recognizes three forms of primary cirrhosis. (1) As a result of alcoholism; (2) as a result of malarial infection; and (3) of syphilis. In giving the characteristic signs of malarial cirrhosis, he says that it is distinguished clinically (1) by a history of chronic malarial infection; (2) by a great enlargement of the liver, and of the spleen also; (3) by a persistent and exceptionally chronic jaundice, lasting in some cases from five to seven years. He further says that it is readily distinguished from the common alcoholic atrophic kind by the great enlargement of the liver, by the absence of dropsy, and by the implication of the spleen. I simply refer to this French authority as substantiating the fact of a malarial cause, but differ from him as to a distinction between the alcoholic and the specimen here presented.

The prognosis in its early stage I believe is good, if we can make the diagnosis sufficiently early so as to place our patients under favorable hygienic surroundings. It is during the acute or inflammatory stage that we have much to hope from. A few years ago, a young man, a physician, thirty-five years of age, came under my observation. He gave a history of violent pains in the region of the liver while occupying a damp malarious district in Chicago. A few years after this, while studying hard for his degree, he was taken sick in Brooklyn, with intermittent fever. This lasted only a few weeks, after which he was able to resume his work, and a few months afterwards graduated. Being of an ambitious turn of mind, he immediately commenced practice in said city. It was not long before he had two offices, and with the phenomenal pressure of hard work occupying his attention day and night in a malarious section, he suddenly became prostrated. It was about October 9, 1885, when he was taken with strange indescribable sensations after having had migraine for several days. This was followed by an epileptiform convulsion, ushering in a fever. For several days I was unable to decide whether it was a case of typhoid or bilious remittent fever. This acute attack lasted about two weeks, when he got much better, so that he was able to attend to ordinary work. For six months after this he had a daily range in the afternoon of a temperature between $100-101^{\circ}$ and frequently 102° . It was at this time I had a consultation with an eminent physician of this city, who pronounced it a case of hepatic abscess. Accordingly, the liver was aspirated in six places, extracting about half a pint of blood, without getting any pus. This was followed for a time by a reduction of the fever and considerable improvement. The horrible forebodings, depressions and attacks of migraine passed away, but partially to return

three months afterwards. It was at this time a specialist in nervous diseases was consulted, who found no symptoms as revealed by the ophthalmoscope. After consultation with eminent authorities upon the liver, it was decided to be a case of hepatitis. He was advised to take an ocean voyage, which was done, with marked improvement combined by dietetic directions. Suffice it to say, that in a few months the extreme enlargement of the liver became nearly normal, and he was able to walk several miles without exhaustion.

Now, after three years from the time he had the first stages of cirrhosis, I can bear testimony, that his general health is about as good as ever, notwithstanding I believe he has a small circumscribed portion of connective tissue growth in his liver. I wish, however, to modify this statement by saying, that if at any time he feels weak, sleepy or confused in mind, he can date it to some indiscretion as to diet. Just so long as he gives his liver so much to do, just so long he keeps perfectly well. It is now no unusual thing for him to walk six or eight miles a day without the slightest exhaustion. From my close observation of this case I believe that with the exception of the destruction of some hepatic cells and the small amount of connective tissue as above described, he is a cured man. It is the sweets and starches that upset him, and so long as he modifies his diet I believe his chances of long life will be as good as any whose liver is normal.

From what has been said you can judge the treatment to be pursued, and the prognosis in the first stages of cirrhosis. As to the second and third stages nothing more can be done than palliative measures. I believe that in the way of diet so long as you can keep patients on the peptonized milk the better. In the above case cited this was for months the main diet. Fowler's solution seemed to act well combined with iodine taken internally, and externally applied over the liver.

*Dr. Schrept, of Vienna, gives a case of cirrhosis hypertrophica, so-called, cured by calomel. While visiting the hospitals in Great Britain, Dr. Andrews, senior physician to St. Bartholomew, London, and consultant physician to Her Majesty the Queen of England, told me he got great results from small doses of mild chloride, together with fifteen grs. of the chloride of ammonium.

As the last case cited was so interesting, the question arises how much may be done towards effecting a cure by counter-irritation and liver aspiration. There is no ignoring the fact that after the operation the man felt greatly benefited, and, as Dr. Hammond said to him, he believed that an abscess was prevented thereby. Dr. Harley, of London, recently gives cases in which he had all the success he anticipated from a resort to this operation. One, a severe case of hardened

hypertrophy of the liver in a gentleman aged fifty-two, who was accustomed to drink a bottle or a bottle and a half of champagne with his dinner while living in South America, and who had tried a course of six weeks at Carlsbad without effect, was punctured by him at the same sitting with a No. 2 English sized trocar twice in the left, and once with a No. 5 trocar in the right lobe, and then the canula was retained for a few minutes in the wound. The relief was immediate, and in eighteen hours the doctor found him sitting up, busy writing letters, and complaining only of a little tenderness at the site of the punctures. In three days he walked a quarter of a mile to the doctor's office, and stated that he felt perfectly well, so that he wished to start at once for South America again. The operation done by Dr. Harley consists merely of puncturing from three to six times, according to the condition of the patient, in the anterior surface of the liver. But the more convenient and perhaps the better instrument, is that which I used in my case, viz., an aspirator. No anæsthetics are required nor any precautions except clean instruments. The pain is but slight, and but little more than that experienced from a hypodermic needle. I therefore believe, then, that all these cases if seen and diagnosed in the first or commencement of the second stage, should be treated by the above plan, or, if combined with this, they are sent to a non-malarious section, they may get well.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

CLEAN STREETS.

For the first time in the history of the City of Brooklyn, the asphalt pavements have been kept clean. Under a special arrangement with the city the firm of Cranford & Valentine has undertaken to keep the streets thus paved free from dirt, and has succeeded. Until the recent snow came the plan was admirably carried out, and it was demonstrated that the proper, systematic and thorough cleaning of the thoroughfares of a great city was not an impossibility, but required only honesty of purpose and executive ability. It is refreshing in these days to find a firm of contractors who mean to carry out a contract when they bid for it, and in this as in all other contracts, so far as we know, which this firm has undertaken, the specifications have been fully carried out.

The asphalt pavement properly laid, as it now exists on Montague, Clinton and other streets, is, in our judgment, the perfection of a street pavement. One who has not lived adjacent to such a pavement cannot appreciate the comfort which it brings. Its noiselessness is one of its most important and beneficent qualities. We have frequently been compelled, when visiting a patient occupying a front room in a house situated on a street paved with stone, to cease conversation entirely until an ice-wagon or truck had passed, so great was the din, and we have wondered how the sick could endure such noise as is inseparably connected with such a pavement. When the asphalt pavement was first laid, it partook very much of the nature of a poultice, and a poor poultice at that; but for the past few years the improvement in its condition has been great, and to-day this kind of pavement can apparently be laid in as permanent a form as that of stone. The policy of the city seems to look toward the laying of stone pavement to the exclusion of all other kinds in all the streets of the city. We regard this as a mistake. While it may be the best for business streets, we believe that for residential streets the asphalt is the kind to be preferred. It is comparatively noiseless, thus contributing largely to the rest, peace and quiet not only of the sick, but the well;

it is less injurious to vehicles of all descriptions, doctors' buggies in particular, and can be kept as clean as a parlor-floor, as has been abundantly demonstrated by Messrs. Cranford & Valentine during the present winter.

THE TELEPHONE SERVICE.

In the September number of the *JOURNAL* we had occasion to criticise the telephone service of Brooklyn unfavorably. We felt certain that the defects which were then complained of were easily remediable, and expressed the opinion that no steps should be left untaken until the desired improvement was effected. We subsequently received a call from Mr. W. D. Sargent, the General Manager of the company, who expressed his willingness to do anything in his power to make the service as perfect as possible. He appreciated the importance of a prompt and efficient service as between physician and patient, and promised to give the matter his personal attention until all cause for complaint was removed. After five months of trial, we are glad to be able to say that Mr. Sargent has fulfilled his promise, and that the service is now, so far as we know, admirable. Mr. Sargent justly complains that subscribers make general complaints of inefficiency, but rarely give any specifications. If, when they have reason to find fault, they would at once inquire for the General Manager, and submit their grievances to him, the defect could be at once remedied.

OBITUARY.

DR. JOHN S. ANDREWS.

A TRIBUTE BY GEORGE E. LAW, M.D.

In 1849, a committee, appointed by the members of the Reformed Church of East New York, advertised in a New York paper for a physician, specifying that he must be of strict integrity, good address, possess a diploma from a first-class medical school, and bring satisfactory references. Dr. John S. Andrews, who had just attained his majority and had a few weeks before received his degree from the University of New York, replied. He was invited to appear before the committee, was approved by them, accepted their proposition, and immediately began practice in the little village five miles from Brook-

lyn. It is faint praise to say that he lived up to his recommendations and the committee's expectations.

Dr. Andrews was born in Connecticut, of good old New England stock, and was fully endowed with the proverbial sterling New England qualities.

His early education was received at a private school in Danbury, and at the Amenia (New York) Academy. On reaching the new field, he found it already occupied by three physicians, yet he quickly gained, and easily held, until his retirement from practice in 1886, the first place in the estimation of the people.

His first obstetric experience will illustrate the aptness of the young man and the reason of his speedy success.

One of the local physicians was attending the case. Difficulty arising, he called in a colleague, and they summoned the third. At length some one suggested the new doctor. He was sent for, and, on his arrival, found three doctors worn out and at their wit's end, the child dead, with an arm presenting, and the mother fast losing strength. He proposed amputating the presenting arm at the shoulder. The weary attendants replied: "Very well; you do it." It was done, the child quickly delivered, and Dr. Andrews' reputation as an accoucheur was established. Within a year he attended nearly one hundred confinements, and never after lacked work.

In the fifth year of his practice he built the house which was his permanent home, and the following year he was married to Miss Christiania Davies, who survives him and with whom he shared the credit for his prosperous career. His professional income, at first small, was probably equalled by few general practitioners in the last twenty-five years of his life. The amount of work which he accomplished was enormous. For weeks together he made no less than forty visits each day, many of them among surrounding farmers and in neighboring villages.

Dr. Andrews' annual vacation was usually of two days' duration, and was the occasion of his going to the old Connecticut home at Thanksgiving time to meet the other members of the family. This custom was never varied from until the death of his mother, which closely followed that of his father three years ago. That such close application was wise he never claimed, but recognized the fact that his life was shortened by it.

He was a general practitioner of the best type. A man of quick perception, sound judgment, and prompt action; bold, but not reckless. Until compelled by failing health he rarely refused a call, and never to those who in his opinion were deserving. He always expected and, when necessary, insisted upon fair compensation from

those who were able to pay, yet few physicians have done more for the deserving poor without hope of pecuniary reward.

He lived to see the little village increase in size fiftyfold, and become absorbed by gradually extending Brooklyn, while hundreds of elevated and surface cars going to and from the river took the place of the one stage making its daily trip, and passing but half a dozen houses before reaching the City Hall.

Dr. Andrews was consulting surgeon to St. Mary's Hospital from its foundation. He was a member of the Medical Society of the County of Kings, the Kings County Medical Association and of the Queens County Medical Society. His consultation practice for many years was extensive.

Public position he never sought, and only accepted as a duty. He was Health Officer of the New Lots Board of Health during almost its entire existence, and on his retirement was highly complimented by the State Board.

In the sixty-second year of his life, Dr. Andrews died, January 3d, 1889. The immediate cause of death was heart failure, the result of chronic bronchitis and emphysema.

An earnest, faithful physician, a wise consultant, a true friend, an honest, manly man is gone.

JOHN CALL DALTON, M.D., LL.D.

Dr. Dalton died in the city of New York, on the 12th of February, at the age of sixty-four, the cause of his death being disease of the kidneys. He was born at Chelmsford, Mass., in 1825. His academic and medical education were obtained at Harvard, where he received his degree of doctor of medicine in 1847. During his life he occupied the chair of physiology in the Medical Department of the University of Buffalo, the Vermont Medical College at Woodstock, the Long Island College Hospital, and the College of Physicians and Surgeons, New York. In 1883 he discontinued his lectures in the last-mentioned college, and subsequently became president of its faculty. In 1861 he entered the army as surgeon, and served his country in that capacity until near the close of the war.

Dr. Dalton was recognized and acknowledged to be the most prominent physiologist of America, and indeed his reputation was not confined to this continent. Wherever the English language is understood, there his fame has extended, and some of the best illustrations to be found in foreign medical literature are those which have been copied from

his writings. His fame was well deserved. No member of the profession was more learned than he. He possessed, too, that quality which is not often found in learned men—the ability to impart his knowledge to others, and thus make them participators with him. An additional power he possessed to a remarkable degree, that of presenting every subject in an attractive form, no matter how dry and uninteresting it might appear to be. These qualities, together with a most genial manner and pleasant voice, made Professor Dalton one of the most popular teachers this country has ever produced. His name is inseparably connected with the best text-book on physiology which was ever written in the English language. It is several years since the last edition of this work appeared, and it can now hardly be looked upon with the same favor as when it issued fresh from the pen of its gifted writer. To-day Prof. Dalton is perhaps best known through this text-book, but in years to come his work on the anatomy of the brain will be regarded as the best work of his life. In all relations of life Dr. Dalton was worthy of admiration, and with his confrères, Agnew and Sands, he will pass into the history of the medical profession of America with a name and fame untarnished and unblemished.



MEDICAL SOCIETY OF THE COUNTY OF KINGS.

At the April meeting of the Society Dr. John M. Peacock will read a paper on "The Disposal of the Dead," and Dr. Hubert Arrowsmith will present a paper entitled "Some Observations on the Climate of Colorado." Members of the Society intending to discuss either of these papers, will please send their names to the president, Dr. A. Ross Matheson, 337 Union St., at an early date.

PROCEEDINGS OF SOCIETIES.

THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

A regular meeting of the Medical Society of the County of Kings was held at the Society Rooms, on Tuesday evening, February 19th, 1889.

Dr. A. Ross Matheson in the chair.

There were about 75 members present.

The minutes of the previous meeting were read and approved.

The Council reported favorably upon the names of Drs. E. A. Hessler and Dwight P. Taylor, and recommended that they be elected to membership.

The following gentlemen, having been regularly proposed and recommended by the Council, were declared elected to membership. Drs. F. H. Clark, H. F. Praeger, F. Le Roy Tetamore, H. S. Thorne, Horace M. Sloat.

The following named doctors were proposed for membership: Drs. D. W. Waugh, 167 Union St., L. I. C. H., 1886; proposed by Dr. A. Ross Matheson, Dr. R. M. Meade. Eugene F. Pearce, 99 Pineapple St., L. I. C. H., 1883; proposed by Dr. F. H. Stuart, Dr. W. M. Hutchinson. Otto E. F. Risch, 208 17th St., L. I. C. H., 1887; proposed by Dr. A. Ross Matheson, Dr. F. W. Risch. Hubert Arrowsmith, 236 Degraw St., L. I. C. H., 1886; proposed by Dr. A. Ross Matheson, Dr. Wm. M. Hutchinson. George H. Parshall, 1047 Third Ave., L. I. C. H., 1884; proposed by Dr. A. Ross Matheson, Dr. W. M. Hutchinson. Adam Schauf, 699 Willoughby Ave., College of Physicians and Surgeons, N. Y., 1887; proposed by Dr. H. D. White, Dr. Wm. M. Hutchinson. J. R. Kevin, St. Mary's Hospital, Bellevue Medical College, 1888; proposed by Dr. F. A. Jewett, Dr. F. W. Rockwell. W. F. Gardner, 162 Sixth Ave., Albany Medical College, 1883; proposed by Dr. Wm. Maddren.

SCIENTIFIC BUSINESS.

Dr. Frank Hudnut read a paper entitled "Peculiar Action of Potassium-Iodide in a case of "Syphilitic Rhinitis."

Dr. Frank Ferguson read a paper entitled "Gastric Tubules in Health and Disease."

Reports of committees.

The following report of the delegates to the State Medical Society was read, received, and placed on file :

REPORT OF DELEGATES.

This year the representation of this Society at the Medical Society of the State of New York was unusually large. Of the twelve delegates elected, ten were present, viz., Drs. Bailey, Cox, De la Vergne, Evans, Fowler, Fox, Maddren, Pilcher, West and Westbrook.

Of the permanent members, Drs. Chase, Prout and Sherwell were in attendance. Drs. Paul H. Kretzschmar and A. Ross Matheson were elected and became permanent members.

Drs. Frank P. Hudnut and C. N. D. Jones were among the invited guests.

Dr. May R. Owen was present as the delegate from Richmond County.

Dr. Pilcher read a paper entitled "A Contribution to the Surgery of Cerebral Tumors."

Dr. Geo. R. Fowler read a paper and presented specimens—subject: "Hernia of the Pleura into the Neck."

Dr. S. Sherwell was made a censor.

Dr. Arthur Mathewson was appointed on the Committee on Ethics.

Dr. Walter B. Chase was appointed delegate to the Medical Society of New Jersey.

Respectfully submitted,

WM. MADDREN,
Delegate.

There being no further business, on motion, the meeting adjourned.

W. M. HUTCHINSON,
Secretary.

KINGS COUNTY PHARMACEUTICAL SOCIETY.

The annual meeting of this Society was held at their rooms, No. 356 Bridge Street, on Tuesday evening, February 12th, 1889. The following were elected for the ensuing year :

President—Wm. M. Davis.

First Vice-President—D. L. Cameron.

Second Vice-President—Chas. W. Brunner.

Secretary and Treasurer—F. N. Bliss.

Assistant Secretary—John Gallagher.

Chairman of Board of Trustees—Thomas M. Lahey.

Elective Trustees—L. E. Nicot, Wm. P. D. Forest, Robert Black, Charles R. Paddick.

Chairman of Board of Censors—L. F. Stevens.

Censors—Dr. L. D. Sheets, E. A. Sayre.

The reports of President and Chairman of Board of Trustees, were read and ordered spread upon the minutes. Secretary's report showed a membership of 161 on the rolls. Treasurer's report showed an increase of nearly one hundred dollars over last year, with a balance of sixteen hundred and fifty dollars in the treasury.

Report of the Executive Committee showed a very gratifying state of affairs. Class members, 38. Average attendance, 100 per cent.

Dr. Eccles, Chairman of Lecture Committee, said there was plenty of good material in our Society for first-class professors. All that was needed was confidence and practice to develop them.

The new President said he would announce the committees at the next meeting.

F. N. BLISS,
Secretary.

BROOKLYN SURGICAL SOCIETY.

At the annual meeting of this Society, the following officers were elected for the ensuing year :

J. S. Wight, M.D., President; H. W. Rand, M.D., Secretary; Geo. R. Fowler, M.D., Member of Council.

REPORT OF THE LIBRARIAN OF THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

We print in full, in this number of the JOURNAL, the report of Dr. J. H. Hunt, the efficient librarian of the Society. There are few medical societies in the United States which have such a list of journals constantly on file in their reading rooms. Of the 200 journals received by the Society, 169 are published in the United States, 21 in Great Britain and its colonies, 7 in Germany, 7 in Italy, 16 in France, 4 in Spain, 2 in Russia, and 1 each in Denmark and Japan.

PROGRESS IN MEDICINE.

OPHTHALMOLOGY.

BY DR. RICHMOND LENNOX.

ESCAPE OF FLUID FROM THE AQUEOUS AND VITREOUS CHAMBERS UNDER DIFFERENT PRESSURES.

Priestley Smith (*Ophthal. Review*, July, 1888) reports on some interesting experiments which he has recently made on this subject, using as material the freshly enucleated eyes of sheep, oxen, and pigs, an aqueous solution of aniline blue being forced into the eye, through hypodermic needles introduced into the aqueous or vitreous chambers, under a pressure which could be controlled by gravitation. Before describing his experiments in detail, he gives a short review of the principal facts recently brought to light in regard to the lymph currents in the eye. The aqueous is secreted by the ciliary processes and perhaps also by the posterior surface of the iris to a small extent, and escapes by filtration through the angle of the anterior chamber. The nutrition of the vitreous probably comes exclusively from the ciliary portion of the uveal tract. For this view we have presumptive, pathological, and experimental evidence. It is hardly probable that a complex structure like the retina should transmit nutriment from the chorio-capillaris to the vitreous, or that this nutritive material should come from the retinal vessels themselves. We know, from the examination of inflamed eyes in an early stage, that the inflammatory exudation into the vitreous comes from, and is limited to, the ciliary region in front of the ora serrata. Then, too, while a shrinking vitreous separates readily from the retina, it is usually firmly connected in front of the ora serrata. Of course this is really only presumptive evidence; but the experiments of Deutschman, who found that excision of the ciliary processes and iris in the rabbit produced total arrest of the secretion of aqueous together with atrophy of the lens and vitreous, and those of Schoelet and Ulthoff, Schick and, later, Leplat, with various substances injected into the general circulation and afterward found in the vitreous, show very conclusively that the vitreous receives its nourishment from the ciliary region alone. It appears to be proved that there is a current of fluid passing from before backward through the vitreous, to escape at the papilla along the central vessels; but we

are not sure whether fluid normally passes forward through the zonule into the aqueous. The escape at the papilla is probably very small.

Priestley Smith's experiments were divided into two groups :

1st. Single injections into either aqueous or vitreous chamber.

2d. Double injections, i. e., those made simultaneously into aqueous and vitreous chambers.

He found that there was, as a rule, a progressive diminution in the quantity of fluid escaping from the eye, according to the time the pressure was maintained. This diminution was usually greatest during the first ten minutes, and he ascribes it in part to the increased viscosity of the ocular fluids from loss of heat.

Single injections into the anterior chamber, at a pressure of 30 cm. (about the normal intra-ocular pressure), allowed in the first half hour an average escape of 785 cubic mm. of fluid. The fluid was at first colorless, afterward blue, and dropped from the cut tissues near the equator of the globe. The ciliary vessels showed a blue injection. Single injections into the vitreous, under the same pressure, allowed an average escape of 275 cubic mm. in the same time. The escaping fluid became slightly tinged with blue only after several hours, and there was only a faint bluish injection of the ciliary vessels. There was no escape of fluid at or near the nerve, nor was there any blue discoloration in this region even after the pressure had been maintained for eighteen hours. Special experiments with the nerve region at the above pressure showed that within twenty-four hours a slight filtration took place, and the exposed surface of the sclera became tinged with blue; the trunk of the optic nerve, however, remained colorless.

An increase of the pressure up to 50 cm. in these single injections appeared to increase the escape or lessen its progressive diminution, whereas raising the pressure still more seemed to lessen the escape. An examination of the eyes which had been injected showed that the anterior chamber was shallower after vitreous than after aqueous injections. After a prolonged vitreous injection at 80 cm. pressure, the base of the iris was found to be pressed against the cornea, closing the angle of the anterior chamber, while injection of the fellow eye at 30 cm. pressure showed a more open angle. After prolonged injection of the anterior chamber at 80 cm. pressure, the vitreous showed no trace of color, nor was the chamber deepened as it would have been had there been an appreciable escape of vitreous fluid at the nerve. Thus single injections of the freshly excised eye show :

1st. That the escape of fluid at the back of the eye is extremely small as compared with the escape in the ciliary region.

2d. That this escape of fluid is about three times as rapid during injection of the anterior chamber as during injection of the vitreous chamber.

3d. They suggest that the position of the iris base influences the escape from both chambers. This is also shown by the double injections, the results of which we will now describe.

Simultaneous injection of both chambers under normal pressure (30 cm.) gave an average escape of 485 cubic mm. of fluid, a little over half of the escape when the anterior chamber alone was injected. This diminution can be due solely to the narrowing of the outlet at the chamber angle from the vitreous pressure. Unequal pressure during double injections caused a displacement of the diaphragm between the chambers (lens, zonule, processes, and iris) proportionate to the difference in pressure. When the vitreous pressure was the higher, the average escape of fluid during the first half hour was only 50 cubic mm. Indeed the escape of fluid in all experiments was greater or less according as the injection tended to widen or narrow the angle of the anterior chamber. In some cases an excess of vitreous pressure of only 1 cm. decidedly checked the escape, and with an excess of 15 cm. the anterior chamber was almost completely emptied and the iris pressed against the cornea.

These experiments further show that the escape at the papilla must be extremely small in comparison with that at the angle of the anterior chamber. They do not show whether there is, under normal conditions, a persistent stream from the vitreous to the aqueous, but do prove that diffusible fluid passes easily from one chamber to the other under a very slight excess of pressure on either side of the diaphragm. Such an osmosis is undoubtedly essential to the stability of the lens. If the normal stream of fluid which enters the vitreous from the ciliary body exceeds the minute stream which escapes around the central vessels of the optic nerve, then the surplus unquestionably escapes through the anterior chamber.

ASTIGMATISM AS A FACTOR IN GLAUCOMA.

Theobald (*Am. Jour. of Ophthal.*, Oct., 1888), in a paper read before the Amer. Ophthal. Society at the recent Congress in Washington, states his belief that astigmatism may favor the development of glaucoma by producing strain of the accommodative apparatus and consequent congestion of the ciliary bodies and choroid. He prefaces his paper with some remarks on astigmatism, particularly that form in which the meridian of least refraction is vertical or nearly so, and which he believes to be far more productive of asthenopic symptoms and trouble than the more ordinary form which can be corrected with plus cylinders with an approximately vertical axis. In this "astigmatism against the rule" asthenopic symptoms are almost sure to make their appearance sooner or later, and Theobald is in the habit not only

of correcting small degrees of it, but of also advising the constant use of the correcting glasses. He believes that the greater number of pronounced cases of chorio-retinitis from accommodative strain are accompanied by this form of astigmatism, and has found in most cases of glaucoma associated with astigmatism that the latter has been of this "topsy-turvy" sort.

Without discussing the etiology of glaucoma, Theobald states that there are probably two essential factors in its production: 1st. A predisposing congenital or acquired defect of drainage in the eye; 2d. An exciting increased secretion of fluid in the vitreous chamber. Hyperæmia of the ciliary body and choroid tend to produce such an increased secretion, and, as above stated, it is by producing this hyperæmia that astigmatism, particularly the form more especially under consideration, may act as a factor in producing glaucoma.

In conclusion, he cites twelve cases from his private practice, those in which a pronounced glaucoma was found accompanied by astigmatism, and also those of astigmatism in which there were signs of a threatened glaucoma. These, while not numerous enough to be conclusive, indicate the advisability of searching for and correcting the possible refractive error in such cases.

DIFFERENTIAL DIAGNOSIS OF PARALYSIS OF THE ELEVATORS AND DEPRESSORS OF THE EYEBALL.

Mauthner (Wien. Med. Wochenschrift, 1888, Nos. 24, 25; Ophthal. Review, Nov., 1888,) bases a diagnosis in these paralyses upon the difference in vertical distance between the double images in adduction and abduction, this difference being dependent upon the varying physiological action of the superior and inferior recti and the oblique muscles as the eye is turned in or out. Thus in abduction the eyeball is raised chiefly by the superior rectus which in adduction acts largely as a rotator, elevation being effected in this position mainly by the inferior oblique, which in abduction acts as the rotator. Mauthner claims that while theoretically the ordinary plan of making a diagnosis by both the vertical and lateral displacement and the rotation of the images is good, it is practically liable to lead one into error chiefly by insufficiency of the interni or externi, by which a theoretical homonymous diplopia becomes crossed or vice versa, whereas a diagnosis based as above solely upon the vertical difference is accurate.

In conclusion he thus formulates his propositions: If the diplopia be in the upper part of the field, then an elevator is at fault, and to decide which one must fix the place of greatest vertical distance between the double images. Then:

If greatest distance be to left and above :

1. When image of left eye higher, left superior rectus at fault.
2. When image of right eye higher, right inferior oblique at fault.

If greatest distance be to right and above :

1. Image of right eye higher, right rectus superior at fault.
2. Image of left eye higher, left inferior oblique at fault.

When there is diplopia in the lower half of the field, these formulæ hold :

If the greatest distance be to left and below :

1. Image of left eye lower, left inferior rectus at fault.
2. Image of right eye lower, right superior oblique at fault.

If greatest distance be to right and below :

1. Image of right eye lower, right inferior rectus at fault.
2. Image of left eye lower, left superior oblique at fault.

ALBUMINURIC RETINITIS.

In the Archives of Ophthalmology, xvii, 3, is an interesting article on albuminuric retinitis by Weeks, based upon the clinical histories and microscopical examination of six such eyes, in one of which a glaucoma had supervened and necessitated enucleation. Without going into the detailed report which he gives of the different cases, suffice it to say that he found in varying degrees the following pathological changes. There was but little evidence of inflammatory action, as would be indicated by increase of nuclei, infiltration with leucocytes, and hyperplasia of connective tissue; on the contrary, the extravascular change was almost exclusively the presence of blood ingredients outside the vessels, ranging from a simple œdema in mild cases due to the watery constituents of the blood and affecting more or less of retina and optic nerve, to an escape of all the blood elements, leading to extensive œdema, deposits of exudation consisting of fibrin, albumen, and colloid material, and lastly hæmorrhages. This exudation is subject to fatty degeneration, which is however usually slight. The escape of the elements of the blood from the vessels must be due to some weakening of their walls, to an impaired nutrition, owing either to some change in the blood composition, to a diminished supply of blood, or to both causes. The hæmorrhages take place from the veins or capillaries, and are brought about by degeneration of the vascular walls from impaired nutrition due to a local stasis from diminished vis a tergo, the calibre of the arteries being more or less contracted by a fibrous or hyaline thickening of their walls and the blood pressure in the capillaries and veins thereby lessened. This hyaline degeneration of the arterial walls affects chiefly the intima, sometimes the media or even the adventitia. It may be seen in any of the arteries, but is

usually best marked in the larger vessels near the disc. Some of the smaller vessels may be rendered impermeable by the swelling of their walls. The exudation is found chiefly near the disc and macular region in the inner retinal layers, the outer nuclear layer and the rods and cones usually escaping. In one case, Weeks found the retinal pigment proliferated, there being three or four rows of cells with distinct nuclei. That such proliferation is unusual in albuminuric retinitis is shown by the fact that it is denied by no less eminent an observer than Leber. Like the exudations, the hæmorrhages occurred both in the retinal layers and in the nerve, and sometimes caused a rupture of the *membrana limitans interna* with consequent escape of blood into the vitreous. In one instance a small exudation between the pigment epithelium and the rods and cones caused degeneration of the latter and a limited separation of the retina. The œdema of the retina affected also the ganglion cells, causing them to swell by inhibition sometimes very considerably. Granular or fatty degeneration of Mueller's fibres was not observed, and Weeks is inclined to regard such degeneration as a post-mortem change. The nerve fibres, though often swollen, did not present the varicosities so often described. The exudative deposits were sometimes of considerable size, involving the inner nuclear as well as the two granular layers, and it is to these that are due the yellowish patches so characteristic of the ophthalmoscopic picture of albuminuric retinitis. As above stated, fatty degeneration of these patches had occurred to a slight extent. The arterial changes may develop very irregularly, and may be more marked in the choroid than in the retina.

There seem etiologically to be two classes of albuminuric retinitis, one following the kidney lesion and depending upon blood changes due to acute nephritis, as in scarlatina, diphtheria, etc., the other being due to a general diseased condition of the arteries, capillaries, and to a less extent the veins, in which the ocular symptoms not infrequently precede those referable to the kidney. The first class is usually accompanied with general anasarca and enlarged kidney; the latter by contracted kidney, there being comparatively little dropsy and the hæmorrhages in the eye being usually the first sign of the retinitis. These forms may coexist in varying degrees.

Nothing definite is known as to the source of the hyaline material in the arteries. It is undoubtedly albuminous, and Carl Theodore has supposed it to be formed by white blood cells which have become lodged in the vascular coats by transudation, and from impaired nutrition lost their outlines.

PATHOGENESIS OF ZONULAR CATARACT.

Beselin (Knapp's Archives of Ophthal., xvii., 3), basing his views upon a careful microscopical examination of such a cataract, is of the opinion that zonular cataract is due to a chemical change in the nucleus of the lens which causes it to shrink from the cortical matter, thus forming one or more fissures, which become filled with granular matter and constitute the opaque part of the lens. This chemical change probably occurs at a period before the cortex is formed, when, in other words, the nucleus forms the whole lens, and may be due to some nutritive change, as from rickets. Succeeding this fissure formation there may be degeneration of the lens fibres. This view, as will be seen, differs radically from the theory that zonular cataract is due to the deposition of a layer of pathological tissue around a normally formed nucleus, and is very well supported by the observations which have already been recorded upon similar conditions.

A STRUCTURAL RELATION AT THE CIRCUMFERENCE OF THE HUMAN IRIS
WHICH HAS PERHAPS SOME BEARING ON THE QUESTION OF
DILATATION OF THE PUPIL.

There are three views as to the mechanism of the dilatation of the pupil:

1st. That it is due to the contraction of an elastic membrane, the posterior limiting membrane of the iris (Gruenhagen, Schwalbe).

2d. That it is due to an actual dilator pupillæ muscle, arising at the sphincter pupillæ and running toward the ciliary border of the iris (Koelliker).

3d. That it is due to the action of a pigmented layer of spindle-shaped muscle cells lying upon the entire posterior surface of the iris (Henle, Iwanoff). Merkel holds a similar opinion, but believes that the muscle consists of isolated bundles instead of a continuous layer. Schwalbe believes these pigmented spindle cells, on the contrary, to be nothing more than the remains of the proximal layer of the secondary optic vesicle, both distal and proximal layers of the vesicle having grown in behind the mesodermic iris to form its pigment.

Ewing (Graefe's Arch. f. Ophthal., xxxiv., 3) has found that the relations at the iris periphery in meridional sections vary as the section passes through a ciliary process or through one of the valleys between the processes. Corresponding to the processes, the iris base is thicker and richer in blood-vessels. In sections passing through the valleys, however, there may be seen a bundle of connective tissue fibres which arise at the corneal margin, partly in the loosely fibrillated tissue adjoining Descemet's membrane which serves as the tendon of the ciliary

muscle, and partly in the fibrous tissue enclosing Mueller's ring muscle. From this origin the fibres run backward and inward, becoming attached to the anterior surface of the posterior limiting membrane, and blend with the anterior fibrous portion of this membrane.

It is known that bundles of smooth muscle fibres radiate like the spokes of a wheel from the sphincter pupillæ. An examination of surface sections of the iris gave regularly the impression that these spoke-like bundles of muscle fibres were directed toward the valleys between the ciliary processes, and consequently toward the above-described connective tissue bundles. A direct connection of the two was however not observed, although the course and position of both bundles rendered it highly probable. Such a connection would naturally give a firm insertion to the muscle at the iris periphery, and enable even a few fibres to act with considerable effect.

REVIEWS.

THE PATHOLOGY AND TREATMENT OF DISPLACEMENTS OF THE UTERUS.

By Dr. B. S. Schultze. Translated from the German. With one hundred and twenty illustrations. New York: D. Appleton & Co., 1888.

This work is a translation of Schultze's work which appeared in German some years ago, and which, from the original views of the author therein expressed, excited a great deal of attention and adverse criticism. The editor of the American edition claims that Schultze has revolutionized the opinions held on the Continent as to the pathology and treatment of uterine displacements, and with the hope of making this revolution felt in other countries he undertook this translation.

In his preface the author expresses the opinion that a thorough knowledge of the normal position of the uterus is indispensable as a foundation for any proper plan for the correction of its anomalous positions, and, inferentially, that as this knowledge is not generally possessed, the treatment of uterine displacements has been far from satisfactory. One of the beneficent results of the constantly increasing practice of bimanual palpation has been to improve this knowledge, and therefore to-day it is possible to lay down more rational and precise indications for treatment, and the results of treatment have become correspondingly greater and more certain.

Dr. Schultze has not written this work for specialists alone, but has constantly had in mind the general practitioner to whom cases of displacement commonly come for treatment. This idea the author expresses in his preface in the following language: "The object of the present treatise will be attained if the following pages contribute to make the displacements of the uterus better known, and more frequently recognized and justly appreciated in ordinary practice, and if they give my colleagues more confidence in the successful treatment of these affections."

The chapter which deals with the normal position of the uterus is alone worth the price of the book. In it the author describes the attachments of the uterus, its

position in the dead body ; its normal movements during life ; the changes in its position due to the condition of the bladder and rectum, and other anatomical and physiological points, without a knowledge of which scientific treatment of displacements is impossible.

Other chapters treat of the definition, classification, and statistics of the displacements of the uterus, and the symptoms and diagnosis of these displacements.

In the part devoted to special pathology the author describes elevation of the uterus, anteversion, retroversion, lateral position, lateral version, and lateral flexion, torsion, anteversion and anteflexion, retroversion and retroflexion, descent and prolapse, and the treatment of each. Hernia and inversion of the uterus are also fully considered. The text is well illustrated by means of one hundred and twenty cuts.

VOL. I., No. 2, OF WOOD'S MEDICAL AND SURGICAL MONOGRAPH is before us, and is well up to the standard promised in the first number.

The monograph on Gonorrhœal Infection in Woman, by William Jap Sinclair, M.A., M.D., is an important one, not only to the specialist in venereal diseases and gynecologist, but to all of us who, as general practitioners, have not properly associated the intractability of the disease and its far-reaching consequences as portrayed by Dr. Sinclair, who says, "That gonorrhœal virus and puerperal septicæmia are the great factors in producing the more serious pelvic diseases, cannot now be disputed against the weight of evidence, and there can be no doubt that a large number of the apparently septic cases are of gonorrhœal origin."

The author quotes largely from Dr. Emil Noeggerath, whom we remember as formerly practicing in New York, and says that his little book on "Latent Gonorrhœa in the Female Sex" "marks a new era in our clinical knowledge of the disease." Considerable space is given to the *Gonococcus* of Neisser.

His conclusions are : (1) Measures should be taken to have the disease cured as quickly as possible on symptoms beginning to appear ; and (2) when a chronic disorder has become established, it should be a positive bar to marriage until there is a sufficient proof that it has been cured for many months.

"Thomas Grainger Stewart, on Giddiness," is the title of the second monograph, in which the author considers giddiness as arising—

- (a) From external conditions.
- (b) From changes in the sensory structures.
- (c) From changes in the conducting fibres.
- (d) From changes in the central nervous system.
- (e) From dyspepsia.
- (f) From toxic causes.
- (g) From causes of uncertain seat.
- (h) From peripheral irritation.
- (i) From mental causes.

Dr. Pierre Jeanton, of Paris, furnishes the third monograph of the series, entitled "A Critical Study of the Clinical Value of Albuminuria in Bright's Disease." He opens his study with a chapter on the chemical examination of albuminous urines, recognizing the fact that we are not chemists, but only clinicians occupied with chemistry.

In his next chapter he considers the diagnostic value of albuminuria, the nature of albuminuria, the connection between albuminuria and the urinary secretion, and

the general condition of the patient.

The whole is supplemented with a copious bibliography of the subject.

INTERNATIONAL POCKET FORMULARY. By C. Sumner Witherstine, M.S., M.D. F. A. Davis, publisher. Phila. and London, 1888.

This is another of the "handy-reference books" with which we are expected to stuff our already plethoric inside pocket.

It is exceedingly convenient. All that we have to know is what ails our patient, and any "old woman" can tell us that, pull out our "pocket formulary," and by means of a neat marginal thumb index turn to the name of the disease and find a selection of prescriptions from which to choose; *i. e.*, our patient has diphtheria; reference to our pocket-book tells us that iodoform 3j in adips 3x is a good thing to rub in the glands of the neck every three hours externally. There are 1659 of these formulæ, and the book is neatly interleaved so that we can add *p. r. n.*

Besides, there is an appendix containing "a posological table; formulæ for inhalations, suppositories, nasal douches, eye washes, and gargles; hypodermic formulæ and table of hypodermic medications; use of thermometer in disease; poisons and their antidotes; post-mortem and medico-legal examinations; artificial respiration; ligation of arteries; obstetrical table; urinalysis; differential diagnosis of eruptive, typhoid, and typhus fevers; tables of pulse, temperature, respiration; motor points, etc." All of which can be purchased for \$2.00 net.

The book is neatly gotten up in visiting list style, beautifully printed on thin paper, and to one who needs that sort of book we heartily commend it.

BOOKS AND PAMPHLETS RECEIVED.

THE VEST POCKET ANATOMIST. (Founded upon "Gray.") By C. Henri Leonard, A.M., M.D., Professor of the Medical and Surgical Diseases of Women and Clinical Gynæcology in the Detroit College of Medicine. *Fourteenth revised edition*, containing 193 illustrations, "Dissection Hints" and Visceral Anatomy. Cloth, 12mo, 304 pages; price \$1.00. Illustrated Medical Journal Co., Publishers, Detroit, Mich.

ANÆSTHESIA BY ETHER. By Jas. H. Parkinson, L.R.C.S.I. 8vo pamph., pp. 18. Reprint from Pacific Med. and Surg. Journal and Western Lancet.

DISEASES OF THE SKIN ASSOCIATED WITH DISORDERS OF THE FEMALE SEXUAL ORGANS. By George H. Rohé, M.D. (Baltimore). 8vo pamph., pp. 13. Reprint from Buffalo Medical and Surgical Journal.

CONTRIBUTIONS TO THE HISTORY OF DEVELOPMENT OF THE TEETH. By Carl Heitzmann, M.D., and C. F. W. Boedecker, D.D.S., M.D.S. 8vo pamph., pp. 98. Reprint from *Independent Practitioner*, vols. viii. and ix. A valuable exhaustive monograph on the histology of this set of organs, fully illustrated with forty-two original plates of microscopical studies of the teeth.

EXPLORATION OF THE CHEST IN HEALTH AND DISEASE. By Stephen Smith Burt, M.D. 12mo, c., illustrated. D. Appleton & Co., New York, 1889.

This little manual is the outgrowth of Prof. Burt's teachings in Physical Diagnosis at the New York Post-Graduate School, and as we would expect is an extremely clear, concise demonstration of the significance of physical signs and their mode of development.

Nearly half the book is taken up with physical methods of diagnosis, devoting a chapter each to the subjects of percussion and auscultation; the remainder of the book being devoted to diagnosis, by physical signs, of diseases of the lungs: exploration of the heart; heart murmurs: diseases of the heart and of thoracic aneurism.

The whole is well illustrated with plates from Sappey, Hirschfeld, Bonamy, and Bean, as well as many original outline plates.

The little book is nicely gotten up, of a convenient size, and good print on clear paper, making it a pleasant book for the busy physician to read in his carriage or the street-cars.

We heartily commend the book to all students of physical diagnosis.

TRANSACTIONS OF THE ROYAL ACADEMY OF MEDICINE IN IRELAND, vol. vi. Edited by William Thompson, M.A., F.R.C.S. General Secretary. 8vo, c. Dublin: Fannin & Co., 1888.

This makes a handsome volume of 482 pages, filled with the wisdom of our Irish brethren.

The work of the Academy is divided into sections of medicine, surgery, obstetrics, pathology, State medicine, and anatomy and physiology.

We have only space to briefly notice a few of the large number of valuable articles which make up the interesting work. In the section of medicine we have been interested in Dr. James Little's note on the power of saccharin in preventing ammoniacal change in urine in chronic cystitis. Its use must, however, be combined with daily use of the catheter.

Dr. J. F. Knott's article on the Fever of Over-Exertion is of interest to those of us who are puzzling ourselves over the nondescript continued fevers.

In the section of surgery we note Mr. R. L. Swan's monograph on the treatment of advanced condition of equino-varus, illustrated with plates; which he concludes with the following lines:

"Diseases desperate grown,
By desperate appliance are relieved,
Or not at all."

Suprapubic lithotomy and cystotomy are treated by Messrs. Kendal Francks and F. Alcock Nixon and Dr. Francis Heuston, while Mr. J. S. McArdle gives an article on enterectomy and enterorrhaphy, illustrated with 17 plates representing the various instruments, sutures, and steps of the operations.

The section of obstetrics is full of good papers, as we would expect from the home of the Rotunda Lying-in Hospital, from the gynæcological department of which Dr. Alfred J. Smith gives a report for the year ending Nov. 3d, 1887.

The section of State medicine contains an article on the distribution of enteric fever in the City of Dublin, illustrated by a map of the city.

To the anatomical section Dr. H. St. John Brooks contributes an article on the distribution of the cutaneous nerves on the dorsum of the human hand, illustrated by two colored plates.

ELECTRICITY IN THE DISEASES OF WOMEN, WITH SPECIAL REFERENCE TO THE APPLICATION OF STRONG CURRENTS. By G. Betton Massey, M.D. Philadelphia and London. F. A. Davis, publisher, 1889, pp. 209.

The author believes that this is the first attempt at a complete treatise on the electrical treatment of the diseases of women. It contains chapters on the apparatus required in gynæcological applications of the galvanic current experiments illustrating the physical qualities of these currents, the action of concentrated milliampère currents on organized tissues, intra-uterine galvano-chemical cauterization, the operative details of pelvic electro-puncture, the Faradic and Franklin currents in gynæcology, the non-caustic, vaginal, urethral, and rectal applications, the electrical treatment of fibroids, uterine hæmorrhage, endometritis, subinvolution, pelvic pain, displacements, extra-uterine pregnancy, amenorrhœa, hydrosalpine and ovarian tumors. In an appendix directions are given for making the battery fluid, amalgamating the zincs, etc.

The book is one which should be possessed by every physician who treats diseases of women by electricity.

MISCELLANEOUS.

THE OLD OAKEN BUCKET.

(As Revised and Edited by a "Sanitarian.")

With what anguish of mind I remember my childhood,
Recalled in the light of a knowledge since gained ;
The malarious farm, the wet, fungus-grown wild-wood ;
The chills then contracted that since have remained ;
The scum-covered duck pond, the pig-sty close by it,
The ditch where the sour-smelling house drainage fell ;
The damp, shaded dwelling, the foul barn-yard nigh it—
But worse than all else was that terrible well ;
And the old oaken bucket, the mould-crustèd bucket,
The moss-covered bucket that hung in the well.

Just think of it ! Moss on the vessel that lifted
The water I drank in the days called to mind,
Ere I knew what professors and scientists gifted
In the water of wells by analysis find.
The rotting wood fibre, the oxide of iron,
The algæ, the frog of unusual size,
The water, impure as the verses of Byron,
Are things I remember with tears in my eyes.
And to tell the sad truth—though I shudder to think it—
I considered that water uncommonly clear,
And often at noon, when I went there to drink it,
I enjoyed it as much as I now enjoy beer.
How ardent I seized it with hands that were grimy,
And quick to the mud-covered bottom it fell ;
Then reeking with nitrates and nitrites, and slimy
With matter organic, it rose from the well.

Oh ! had I but realized, in time to avoid them,
The dangers that lurked in that pestilent draught,
I'd have tested for organic germs and destroyed them
With potassic permanganate ere I had quaffed ;
Or, perchance, I'd have boiled it, and afterward strained it
Through filters of charcoal and gravel combined ;
Or, after distilling, condensed and regained it,
In potable form, with its filth left behind.
How little I knew of the dread typhoid fever
Which lurked in the water I ventured to drink ;
But since I've become a devoted believer
In the teachings of science I shudder to think.
And now, far removed from the scenes I'm describing,
The story for warning to others I tell,
As memory reverts to my youthful imbibing
And I gag at the thought of that horrible well,
And the old oaken bucket, the fungus-grown bucket—
In fact, the slop bucket—that hung in the well.

J. C. BAYLES.

VITAL STATISTICS FOR DECEMBER, 1888.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Data of Comparison :

Population, estimated January 1, 1889	814,505	The number of Births reported was.....	1169
Inhabited houses, about.....	94,000	The number of Marriages reported was.....	463
In the month of December there were 1476 Deaths, the rate of mortality being 21.56 per 1000 of population.		The number of Still-births reported was.....	101

The Mortality, by classes and by certain of the more important diseases, was as follows:

Causes:

1. Zymotic.....	295	Malarial Diseases	10
2. Constitutional	240	Diarrhoeal Diseases (all ages).....	10
3. Local.....	777	“ “ (under five years), ...	2
4. Developmental.....	121	Phthisis.....	168
5. Violence.....	43	Bronchitis.....	101
Measles.....	21	Pneumonia.....	203
Croup.....	49	All Respiratory.....	337
Diphtheria.....	96	Bright's Diseases.....	51
Scarlet Fever.....	30	Puerperal Diseases.....	13
Typhoid Fever.....	26	Old Age.....	37
Whooping Cough.....	30	Suicide.....	7

Reported Cases:

Diphtheria.....	250	Measles.....	277
Scarlet Fever.....	205	Typhoid Fever.....	69

During the month no cases of small-pox were reported.

Deaths, by sex, color, and social condition, were as follows:

Male	768	Native	1059
Female.....	708	Foreign.....	417
White.....	1455	Married.....	380
Colored.....	21	Single.....	889
Widows, Widower, and not stated.....	207		

Still-births, excluded from list of deaths, were as follows:

Males.....	53	Total	101
Females	48		
Deaths in public institutions.....	104	Homicides.....	0
Deaths in tenement houses.....	682	Suicides.....	7
Inquest cases.....			139

Age Periods:

Deaths under 1 year.....	317	Total deaths, 5 to 20.....	123
“ “ 5 years.....	276	“ “ 20 to 40.....	273
Total deaths under 5.....	593	“ “ 40 to 60	254
		“ “ 60 and upwards.....	232

Certain foreign and American cities show the following death-rates for the month of December:

Brooklyn.....	21.56	Vienna.....	21.08
New York.....	24.65	Paris.....	20.74
Philadelphia	16.89	London.....	17.30
Berlin.....	20.16	Glasgow.....	19.75
Dublin.....			25.60

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

REPORT OF LIBRARIAN.

No. of books and pamphlets in library.....	2934
No. of journals on file in the reading-room.....	204
No. of additions to library since last annual meeting.....	485
Being 235 more than last year.	

These have been derived from the following sources :

By purchase	60
By journals, bound.....	70
Brooklyn Med. Journal exchanges, etc.....	74
Donations	274

Derived from the following sources: Drs. J. S. Prout, 1; 'A. N. Bell, 4; Henry C. Coe, 4; L. S. Pilcher, 2; R. J. Dunglison, 2; J. G. Atkinson, 6; Wm. H. Thayer, 96; L. D. Miller, 14; James E. Pilcher, 2; E. H. Bartley, 2; F. W. Rockwell, 1; J. S. Wight, 2; Mr. George E. Ashley, 2; Drs. Wm. Schroeder, 30; R. G. Gardner, 1; E. P. Thwing, 1; Mr. W. A. Purrington, 1; Drs. A. H. Buckmaster, 16; Samuel Hart, 1; Jos. H. Hunt, 30; N. Y. Hospital, 1; N. Y. Co. Med. Soc., 2; Penn. Med. Soc., 1; Bureau of Education, 2; N. Y. Acad. of Med., 1; Am. Pediatric Soc., 1; Cooper Union, 3; Boston Soc. Civil Engineers, 1; Brooklyn Path. Soc., 1; Albany Med. Lib. Jour. Ass'n, 3; Dr. H. W. Rand, 27; Exchange, 1; Unknown, 13. Besides which we have received large bundles of journals from Drs. G. W. Brush, Chas. Jewett, and L. S. Pilcher.

The Board of Trustees have paid the bills for bindings and subscriptions of such journals as we have been compelled to purchase.

The purchase of books has been made from a fund amounting to \$145, collected by the Library Committee.

It will be readily perceived that but little could be done with so small a sum.

The fund has been devoted to the purchase of a complete set of the Transactions of the London Path. Soc., 39 vols., and the filling up of broken sets of books, such as Index Catalogue of the Lib. Surg. Genl's. Office, etc.

In the purchases your Librarian has expended \$163, \$8 more than he has received.

The Committee authorized at the last annual meeting, consisting of the following gentlemen—Drs. Francis H. Stuart, Henry N. Read, Frank E. West, Geo. R. Westbrook, George E. Law, Chas. N. Cox, George A. Evans, Glentworth R. Butler, W. M. Hutchinson, David

Myerle, E. J. Chapin Minard, A. C. Rogers, Wm. M. Thallon, J. W. Fleming, J. M. Van Cott Jr., Edgar A. Day—attempted to hold several meetings; but consisting as it did of busy men, it was found impossible to get them all together. They have done the best they could under the circumstances, and have collected the following amounts, for the use of which I have accounted above:

Drs. William Wallace, \$10; H. C. Matthews, \$5; Francis H. Stuart, \$10; J. Y. Tuthill, \$5; George A. Evans, \$10; Chas. Jewett, \$20; George Wackerhagen, \$5; Mosher and Hall, \$5; G. Schmetzer, \$5; T. R. French, \$10; H. S. Gilbert, \$10; Wm. H. Kretzschmar, \$5; George E. Law, \$5; George R. Fowler, \$20; F. W. Rockwell, \$5; Z. T. Emery, \$5; Sidney Allen Fox, \$5; Wm. A. Little, \$5; A. J. McCatty, \$10.

It will be seen that the Brooklyn Medical Journal has fulfilled the expectations formed for it. Though starting new and entirely unknown, it has been enabled to contribute 74 vols. of books and pamphlets, and files of over 200 journals, the whole amounting to more than \$500.

The following medical journals are on file in the reading-room, nearly all of which are exchanges of the Brooklyn Medical Journal:

United States.

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| Abstract and Index. | Cincinnati Medical Journal. |
| Albany Medical Annals. | Cincinnati Medical News. |
| Alienist and Neurologist. | Cleveland Medical Gazette. |
| American Analyst. | Clinique. |
| American Drug-clerks' Journal. | College and Clinical Record. |
| American Journal of Med. Sciences. | Columbus Medical Journal. |
| American Journal of Obstetrics and Diseases of Women and Children. | Consumers' Medical Journal. |
| American Journal of Pharmacy. | Daniel's Medical Journal. |
| American Lancet. | Dental Advertiser. |
| American Medical Journal. | Dental Cosmos. |
| American Med. Digest. | Denver Medical Times. |
| American Monthly Microscopical Journal. | Dietetic Gazette. |
| American Practitioner and News. | Doctor (N. Y. City). |
| American Veterinary Review. | Druggists' Bulletin. |
| Annals of Gynaecology. | Drug Topics. |
| Annals of Hygiene. | Ephemeris. |
| Archives of Dentistry. | Epitome. |
| Archives of Gynaecology, Obstetrics, and Pediatrics. | Ft. Wayne Journal of Medical Sciences. |
| Archives of Pediatrics. | Gaillard's Med. Journal. |
| Atlantic Medical and Surgical Journal. | Good Health. |
| Babyhood. | Hahnemannian Monthly. |
| Boston Medical and Surgical Journal. | Herald of Health. |
| Buffalo Medical and Surgical Journal. | Homoeopathic Journal of Obstetrics. |
| California Homoeopath. | Independent Practitioner. |
| California Medical Journal. | Index Medicus. |
| Chicago Medical News and Examiner. | Indiana Medical Journal. |
| Chicago Medical Times. | International Medical Synopsis. |
| Cincinnati Lancet and Clinic. | International Journal of Antiseptics. |
| | Journal of the American Medical Association. |
| | Journal of Antiseptics. |

United States.—Continued.

- Journal of Balneology and Medical Clippings.
 Journal of Cutaneous Genito-urinary Disease.
 Journal of Dietetics.
 Journal of Nervous and Mental Diseases.
 Journal of N. Y. Microscopical Society.
 Lamphear's Kansas City Medical Index.
 Leonard's Illustrated Medical Journal.
 Library Journal.
 Library Notes.
 Maryland Medical Journal.
 Medical Advance.
 " Age.
 " Analectic.
 " Brief.
 " Bulletin.
 " Call.
 " Chips.
 " Classics.
 " Counsellor,
 " Herald.
 " Missionary Record.
 " News.
 " Press of Western New York.
 " Record.
 " Register.
 " Science.
 " Summary.
 " Standard.
 " Visitor.
 " Waif.
 " World.
 Memphis Medical Monthly.
 Microscope.
 Microscopical Bulletin and Science News.
 Nashville Journal of Medicine and Surgery.
 National Druggist.
 New England Medical Monthly.
 New Orleans Med. and Surg. Journal.
 New York Medical Abstract.
 New York Medical Journal.
 New York Medical Times.
 New Yorker Medizinische Presse.
 North American Journal of Homœop.
 North Carolina Medical Journal.
 Northwestern Lancet.
 Occidental Medical Times.
 Obstetrical Gazette.
 Pacific Record of Medicine and Surgery.
 Philadelphia Medical Times.
 Physician and Surgeon.
 Physicians' and Surgeons' Investigator.
 Physio-Medical Journal.
 Pittsburgh Medical Review.
 Polyclinic.
 Post-Graduate.
 Progress.
 Quarterly Journal of Inebriety.
 Sacramento Medical Times.
 St. Louis Courier of Medicine.
 St. Louis Med. and Surg. Journal.
 Sanitarian.
 Sanitary Era.
 Sanitary Inspector.
 Satellite of the Universal Med. Sciences.
 Science.
 Scientific American.
 Southern California Practitioner.
 Southern Clinic.
 Southern Medical Record.
 Southern Practitioner.
 Southwestern Medical Gazette.
 State Board of Health Bulletin (Tenn.).
 Spelling.
 Texas Courier of Medicine.
 Texas Health Journal.
 Therapeutic Gazette.
 Trans. N. Y. Acad. of Science.
 Virginia Medical Monthly.
 Weekly Statement of Board of Health (Brooklyn).
 Western Medical Reporter.
 Western Dental Journal.

English.

- Australian Medical Gazette.
 British Gynæcological Journal.
 British Medical Journal.
 Canada Lancet.
 Canada Medical and Surgical Journal.
 Canadian Practitioner.
 Chemist and Druggist.
 Dublin Journal of Medical Science.
 Edinburgh Medical Journal.
 Hospital.
 Hospital Gazette.
 Journal of Laryngology and Rhinology.
 Lancet.
 Liverpool Medico-Chirurgical Journal.
 Manitoba, Northwestern and British Columbia Lancet.
 Medical Chronicle.
 Montreal Medical Journal.
 New Zealand Medical Journal.
 Proceedings of Royal Med. Chirurgical Society.
 Transactions of the Pathological Society of London.
 Union (L) Médicale du Canada.

German.

Allgemeine Wiener medizinische Zeitung.	Drogisten-Zeitung.
Centralblatt für Chirurgie,	Illustrierte Monatschrift Artzlischen-Polytechnik.
“ für Gynäkologie.	Wiener medizinische Wochenschrift.
Deutsche medicinische Wochenschrift.	

Italian.

Archivio di ortopedia.	Giornale Italiano delle malattie veneree della pelle.
Bollettino di Medicina e Farmacia.	
Bollettino della r. Accademia medica di Roma.	Giornale R. Accademia di Medicina di Torino.
Gazzetta Medica Catalana.	La Riforma Medica.

French.

Annales médico-chirurgicales françaises et étrangères.	Journal des Sciences Medicales de Lille.
Annales de la société med.-chir. de Liège.	Journal d'Hygiène
Archives Roumaines.	Nouvelles archives d'obstétrique et de gynécologie.
Bulletin de l'Académie de médecine (Paris).	Revue de Chirurgie.
Bulletin International des Sociétés de la Croix-Rouge.	Revue Illustrée Polytechnique médicale et chirurgie orthopédique.
Electrothérapie (L').	Revue internationale des sciences médicales.
Gazette de gynécologie.	Revue de médecine.
Gazette (La) médicale de Montreal.	Union (L') médicale.

Spanish.

Anales de la nat Academie de ciencias medicas (Havana).	La Medicina Científica Barada en la Fisiologica y en la Experimentacion Clinica (Mexico).
Cronica medico-quirurgica de la Habana.	Revista Medico - Quirurgica (Buenos Ayres).

Danish.

Hospitales Tidene.

Russia.

Two Journals.

Japan.

One Journal.

Respectfully submitted,

J. H. HUNT, *Librarian.*

MALE STERILITY AND GYNÆCOLOGY.

Dr. Fuerbringer, of Berlin, has written some important observations on this subject in the *Deutsche Med. Wochenschrift*, No. 28, 1888. He believes that sterility in the male is far more frequently the cause of barren marriages than is generally believed to be the case. Aspermatismus is associated with complete impotence, but azoospermia, or absence of spermatozoa in the semen, a condition by no means rare, may exist with perfect potency, and on that account is very easily overlooked. With few exceptions, azoospermia is caused by obliteration of part of the seminal ducts. This condition is generally caused by double gonorrhœal epididymitis, or inflammation of the vas. After that malady, the chances are, Dr. Fuerbringer has calculated, nine to one that azoospermia will follow. Prognosis appears to be hopeless when the condition in question is not discovered till three or four months after the onset of the local inflammation. The chief importance of the management of the case lies in accurate diagnosis. True aspermatism is traced by Dr. Fuerbringer to arrested development of the ejaculatory ducts. He declares that in several cases of sterile marriages under his own observation the unfortunate wife had been sent from physician to physician, or from hospital to hospital, and her cervix divided or her endometrium scraped, until a glance at the microscope proved that nothing was wanting to ensure the blessing of children, excepting spermatozoa. Dr. Fuerbringer's observations are worthy of consideration. No doubt the increase of temperance involves the relatively greater frequency of those forms of gonorrhœa where the early symptoms are very mild. Hence the first stages may now be as much neglected by patients as they have ever been wont to neglect later stages. The more a case of gonorrhœa is neglected, the greater will be the chance of serious secondary complications.—*British Med Jour.*

NEW YORK STATE MEDICAL ASSOCIATION.

The fifth annual meeting of the Fifth District Branch of the N. Y. State Medical Association will be held in Brooklyn, on Tuesday, May 28, 1889. All Fellows are invited to present papers, communications, relation of cases and specimens at the meeting. All *written* communications presented will be published under the direction of the Executive Committee.

E. H. SQUIBB, M.D., Sec'y,
P. O. Box 94, Brooklyn.

W. T. LUSK, M.D.,
President.

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 5.

BROOKLYN, N. Y., MAY, 1889.

WHOLE No. 17

ORIGINAL ARTICLES.

TWO CASES OF DISLOCATION OF THE ASTRAGALUS.

BY J. S. WIGHT, M.D.,

Professor of Operative and Clinical Surgery at the Long Island College Hospital, Brooklyn, N. Y.

Read before the Brooklyn Surgical Society, February, 1889.

Mr. M——, a laborer, thirty-one years of age, while at work, November 26, 1886, had part of a steam-pump, weighing about six hundred pounds, fall on the outer and back surface of his left leg, just above the ankle. He was borne to the ground and held fast till the other workmen removed the pieces of steam-pump. He was then brought to the College Hospital, where I saw him on his arrival. I had him taken into the operating amphitheatre before the medical class, and on examination I found the following facts:

The fibula had been broken about three inches above the ankle-joint; the internal malleolus had been broken off almost transversely near its base, and the lower end of it had been displaced inward and upward; the foot, with the exception of the astragalus, had been dislocated outward and much everted; it had followed the fibular fragment in its outward and upward displacement; and the astragalus had been dislocated inward, being rotated on its antero-posterior axis, so as to present the lower articular surfaces toward the other foot. The lower surfaces of the astragalus could be easily felt and traced under

the skin, which had become very tense by the pressure; and the external calcaneo-astragaloid ligament was still intact, acting the part of a hinge between the astragalus and the os calcis; but the interosseous ligament had been ruptured by the dislocating force. A little more violence would have made the injury compound. There was abundant and extensive extravasation of blood, and the pain was very severe, especially during the necessary examination.

I then remarked, that the injury was somewhat like one form of Pott's fracture, in which the foot is dislocated outward, in addition to a fracture of the internal malleolus and the fibula. But in the case under consideration, there had been a sub-astragaloid dislocation of the foot outward, as well as a dislocation of the astragalus inward; and while the fractures of the leg-bones, as well as the dislocation of the main part of the foot, were important, the dislocation of the astragalus seemed to be the leading injury. Hence, the case is spoken of as one of dislocation of the astragalus. When the heavy weight came on the leg, pushing it inward and downward, the os calcis and the scaphoid bone were torn from the astragalus, and with the anterior part of the foot were carried outward along with the fibular fragment. Then the astragalus was rotated and dislocated inward, pushing upward the fragment of the internal malleolus. The appearance was very unusual and singular.

It was impossible to say beforehand what could be done and what would be the result of treatment. I could not affirm that an attempt to reduce the dislocated astragalus would be successful. Inflammation might follow, so as to disable the ankle more or less completely, or lead to the necessity of amputation. At the outset it would be proper to attempt reduction. Ether was administered; an assistant then pulled downward and inward on the foot; and at the same time I pushed outward and somewhat downward on the astragalus and the fragment of the internal malleolus. In a few moments the astragalus went into place, and the os calcis resumed its normal position under it. The fragments of the leg-bones were well reduced, and the deformity was mostly removed. The injured parts were laid on a well-padded splint, having a strong side-piece, on which there was fastened a piece to support the foot, in order to keep it from abducting and flexing too much. This patient made a good recovery. He had a limb as useful as the average that follows the treatments of Pott's fracture.

Mr. B——, a laborer, about thirty years of age, was on horseback, November 14, 1887, when the horse fell. His left foot and ankle were caught under the horse and severely injured. He was soon brought to the College Hospital, where I saw him, and in the presence of the medical class, noted the following facts :

There was a large swelling on the inner aspect of the left ankle. This was caused partly by a hæmatocele and partly by dislocated and displaced bone. The hæmatocele extended upward on the leg and forward on the foot, and was very tense; the displaced fragment was the internal malleolus, that had been split nearly off almost directly upward; and the dislocated bone was the astragalus, that could be felt projecting inward under the skin. The socket in the scaphoid bone could be felt. The pain was very severe.

Then I asked the following questions: Can this dislocated bone be reduced? Is the blood from a wound of the posterior tibial artery? Shall the astragalus be exsected? Ether was administered; a reasonable attempt was made to reduce the astragalus, but it was immovable. I then opened the hæmatocele, cutting down on the astragalus; for it seemed to me that I had to treat a traumatic aneurism of the posterior tibial artery. There was an abundant flow of blood from the hæmatocele, and then from the wounded artery, whose ends were caught by hæmostatic forceps. Again an effort was made to reduce the astragalus, but it would not move. The head of the astragalus had been torn from the scaphoid bone, and had been carried about fifty degrees backward. The body of the bone was held firmly between the lower end of the tibia and the os calcis. While an assistant held aside the tendons of the flexor longus and posterior tibial muscles, I seized the head of the astragalus with the lion forceps, and with much difficulty exsected it. Then I removed the malleolar fragment, because it appeared to be in the way, and because it would probably not unite well with the rest of the bone. The distal end of the torn artery was ligated in the usual way. The proximal end was ligated with a deep suture, carried under it with a large curved needle.

The injured parts were dressed antiseptically, being put in a well-padded wire trough splint. Especial pains were taken to keep the foot at a proper angle with the leg. It was flexed somewhat beyond a right angle, and much care was necessary to prevent adduction and inversion of the foot. In fact, it required constant attention during the entire treatment to keep the foot well everted and abducted. This patient had very little discharge from his wound, and did not have surgical fever. At the end of fourteen weeks he was discharged with a useful limb. In July, 1888, I saw this man driving an ice-cart. He had some limp. His ankle was strong; there was a new joint. The flexion and extension of the foot were about one-third normal. The foot was not abducted. The result was beyond expectation. He prefers the present result to an amputation.

I have the following theory in regard to the causation of this injury: The anterior part of the foot and the os calcis were forcibly

everted; the astragalus was held in place between the malleoli; the scaphoid bone was torn from the head of the astragalus; the sustentaculum tali—the lesser process of the os calcis—was carried under the astragalus and caught in its grooves; the pressure of the astragalus split off the internal malleolus. The astragalus also was, as it were, impaled on the lesser process of the os calcis; and when the foot was carried back toward its normal position, the astragalus, keeping its new relation with os calcis, was dislocated inward, since the internal malleolus had been broken off and offered but little resistance.

TWO CASES OF SUPRAPUBIC CYSTOTOMY.

BY H. W. RAND, M. D.,

Attending Surgeon, Long Island College Hospital, etc.

Read before the Brooklyn Surgical Society, March 7, 1889.

CASE I.—J. T., aged 42, was referred to me by Prof. Skene and Dr. Dickinson, who had made a diagnosis of stone in the urinary bladder. Besides the usual symptoms of stone, he had for some months complained of constant thirst and increasing debility, and had lost about thirty pounds in weight during the three or four months prior to operation.

Examination of his urine, made by Dr. Dickinson, resulted as follows: sp. gr. 1009, reaction alkaline, odor foul and ammoniacal, 50 per cent. albumen, pus cells in abundance, and degenerated cells of various kinds, but no casts.

Nov. 7th.—Examination with Thompson's searcher showed the presence of a stone over two inches in diameter, lying at the neck of the bladder. With the finger in the rectum the stone could be pushed forwards so as to be easily grasped through the abdominal walls by the disengaged hand.

While he was under observation prior to operation his temperature ranged from 100° to 102°, occasionally reaching 103°, the maximum point generally being attained between 1 and 2 p.m. Pulse 100 to 120, tongue thickly coated, breath offensive, and his condition generally bad. Frequent irrigation of the bladder with a saturated solution of boric acid, and the administration of the same drug by the stomach, rendered the urine fairly clear and removed its foul odor, but the temperature was not appreciably modified. Thinking the febrile disturbance might be due in part to malarial infection, he was put on full

doses of quinine, sufficient to cause marked cinchonism ; but, although continued for several days, it failed to produce any apparent good effect.

The patient's condition getting worse rather than better, despite local and general treatment, it was deemed best to operate notwithstanding his unfavorable symptoms. Dec. 11, 1888, I did a suprapubic cystotomy, and removed a stone weighing 1170 grains, its length being two inches and three-eighths and its greatest width one inch and three-quarters. The bladder-wall was much thickened, its mucous membrane dark red, resembling granulation tissue in appearance and feel. A medium-sized soft catheter was passed through the urethra, and a drainage tube introduced through the abdominal wound to the floor of the bladder. A couple of sutures were taken in the upper part of the abdominal wound, and the lower part left open and loosely packed with iodoform gauze.

The highest temperature the day previous to operation was 101.2° , on the day of operation 101° , and the same the following day, but thereafter it steadily though slowly declined to normal. The bladder was irrigated every four or five hours with a solution of boric acid, gr. x, salicylic acid, gr. 1, to each ounce of water.

Dec. 13th.—The catheter, although causing no inconvenience, was removed and an attempt made to introduce a new one. Gentle effort failing, however, and the urine being fairly clear, it was left out until the 15th, the patient being meanwhile kept upon the side.

Dec. 15th.—A small rubber catheter was introduced with the aid of a guide; and after it was found that the urine flowed through it freely, the patient being now upon his back, the suprapubic tube was withdrawn from the bladder, but its end left in the prevesical space to take care of any overflow should the catheter become obstructed, and to facilitate irrigation of the bladder.

Dec. 18th.—A little mucoid discharge from the urethra was deemed a sufficient cause for withdrawing the catheter, although the patient had no pain or inconvenience from its presence. By the next day all signs of urethral irritation had disappeared and a catheter was again introduced.

Dec. 22d.—Patient for the first time complained of the catheter feeling uncomfortable, and it was withdrawn. For the next few days there was just enough discharge of a muco-purulent character to keep the glans moistened; rarely could a drop be expressed from the urethra. The catheter had been retained in the urethra for eight days, but not continuously.

Fearing to resort further to urethral drainage, the patient was placed upon his side, and the end of the tube being kept in the abdom-

inal wound, most of the urine passed through it, and the patient was thus kept fairly dry.

Dec. 26th.—Fifteen days after the operation patient passed a couple of ounces of urine per urethram.

Dec. 27th.—An indurated spot was discovered just anterior to the peno-scrotal junction on the right side, and another in the left side of the bulb. These phlegmons increased, and on Jan. 4th I incised the one at the bulb, giving exit to a small quantity of laudable pus; and the next day I opened the one situated anteriorly, there being no connection between them. These abscesses were clearly the result of a periurethritis and not of urinary infiltration.

The patient was now urinating at regular intervals and apparently emptying his bladder, the urine being fairly clear and free from bad odor.

Jan. 7th.—The urine becoming again offensive, a catheter was passed, and it was found that the bladder contained several ounces of residual urine. Thereafter, for about three weeks, the catheter was introduced several times daily.

Jan. 11th.—For the first time urine passed through the abscess opening at the peno-scrotal angle, during micturition.

Jan. 17th.—Lower abscess closed. A few drops of urine still pass through the opening anterior to the scrotum. The granulations in the abdominal wound are weak and show but little tendency to cicatrize, although no urine has passed this way since Jan. 9th. Patient sitting up, and was walking about his room a few days later.

The wound gradually cicatrized, the fistula closed, the quantity of residual urine grew less, and the patient passed from under my care Jan. 31st.

March 2d.—This patient came to my office and claimed to be in perfect health, having regained more than he had lost in weight, but he reported that a few drops of urine had occasionally oozed from the old opening at the peno-scrotal angle during micturition. This, however, was growing less frequent and had not troubled him for several days.

CASE II.—J. H., aged 43, came to me, Dec. 14, 1885, with a history of frequent attacks of hæmaturia during the previous two and a half years. For some weeks urination had been painful, especially towards the end of the act, but not abnormally frequent. He referred the pain to the glans penis and hypogastrium. Examination of urine showed blood cells in abundance, with a few pus cells. Examination of the bladder with the searcher, negative. By Thompson's method I demonstrated, however, that the blood came from the bladder and not

from the kidneys. Prostate slightly enlarged. After a few weeks' treatment the pain entirely ceased, and in two months from his first visit no blood could be detected in the urine.

I did not see this patient again until July 29, 1887, when he returned with the same symptoms that had first brought him to me. He reported that he had remained free from pain until a week prior to this visit, but had been troubled with occasional slight and transient attacks of hæmaturia.

Examination of the bladder with the searcher now showed that there was a growth of some kind to the left of the trigone. An exploratory operation was advised, but declined. He was now urinating every two hours, and had constant pain in the hypogastrium and rectum. For the next year the disease apparently made slow progress, medication affording more or less relief. In August, 1888, he had an attack of typho-malarial fever, and, following this, a persistent diarrhoea lasting for nearly two months.

In December, 1888, he consented to an operation. He was now urinating every half hour, with great pain, and passing quantities of blood, sometimes in clots. During the past five months he had lost rapidly in weight, but had preserved a fairly healthful appearance in spite of his long-continued suffering.

On December 31st, at the Long Island College Hospital, I did a suprapubic cystotomy on this patient. On opening the bladder a large lobulated mass came into view. The largest portion of the growth was situated to the left of the trigone, but it involved all the trigone, and encroached upon the neck of the bladder. The diameter of the tumor at its base was about three inches, the lateral diameter being somewhat the greater. The growth was very vascular, and so friable that portions of it were easily removed with the fingers. With a Volkmann's sharp spoon I scraped away the mass as thoroughly as possible. Bleeding was somewhat profuse, but was controlled with a hot solution of corrosive sublimate (1 : 20,000). Had this failed to check the hæmorrhage, it was my intention to press the end of a hard-rubber vaginal speculum of large diameter upon the bleeding surface, sponge the field as dry as possible, and apply a Paquelin cautery, and in this way, step by step, cauterize the entire base of the growth. For drainage I first inserted through the perinæum and prostatic urethra, after Keyes' method, a large-sized soft-rubber catheter, and then passed a T-shaped drainage tube through the abdominal wound to the floor of the bladder. The upper half of the abdominal wound was sutured and the remaining cavity loosely packed with iodoform gauze.

The highest temperature during the first two weeks after the operation was on the second day, when it rose to 101.2°. The next day it

fell to 100.2° , and soon was normal. At the end of the second week, however, when the bladder had not been washed out for twenty-four hours and the patient had been allowed to sit up, the temperature rose to 102.2° , but it fell to normal soon after irrigation of the bladder.

The third night after the operation the patient got out of bed, and in the morning it was found that the suprapubic tube had been drawn from the wound. As the patient had objected to permanent drainage, the tube was not reintroduced, but a short one was passed to the bottom of the prevesical space. Occasionally the catheter would become obstructed, when it was removed, sterilized by boiling, and reintroduced.

No urine passed through the suprapubic opening after Jan. 7th, one week after the operation.

Jan. 8th.—Removed the tube from the abdominal wound, and approximated the edges with adhesive strips.

Jan. 15th.—Removed the catheter.

Jan. 16th.—Patient urinating every two hours with trifling pain. Urine clear except the last few drachms passed, which contain some pus and occasionally a little blood.

Jan. 17th.—Eighteen days after the operation, patient was up and about the ward. Abdominal wound nearly closed, and only a few drops of urine passing through the perineal opening.

Jan. 23d.—Perineal wound entirely closed.

Jan. 26th.—Abdominal wound completely cicatrized.

Jan. 28th.—Patient discharged.

At no time did the catheter cause any apparent irritation, either in the perineal tissues or the deep urethra.

I have, in this report, omitted the details of an operation that has been of late so often described, but have given the most salient points in the subsequent history of these cases for the purpose of eliciting discussion on some of the methods of after-treatment, about which there is, as yet, considerable difference of opinion among surgeons.

The case of stone was that of a man with a severe type of chronic cystitis, who had for some time been suffering from septic fever due to absorption of the products of decomposing urine. My reasons for not suturing the wound in the bladder were, first, the extensive pathological changes in the bladder; second, the impossibility of rendering a wound in such a bladder thoroughly aseptic; and, third, the condition of the patient being unfavorable to primary union.

The first object I had in view, in resorting to urethral as well as suprapubic drainage, was frequent and thorough irrigation of the bladder, with a minimum of disturbance to the patient and to the wound. Considerable difficulty was at times experienced in introdu-

cing a soft catheter, even with a guide, owing to an unequal hypertrophy of the lateral lobes of the prostate and to hypertrophy of the membrane of the vesical neck, and it was thought that less irritation would result from retention of the instrument than from its frequent introduction and withdrawal. Again, I had hoped that by such thorough local treatment the cystitis would in a few days be so far under control as to enable me to depend solely upon urethral drainage; and, by keeping the patient upon his back and withdrawing the suprapubic tube, allow the bladder wound to heal promptly; for it seemed to me that this was a case in which urinary fistula might occur if closure of the wound was for any length of time interfered with, either by the presence of a tube or by the continuous flow of urine and pus, and the frequent passage of irrigating fluid through the opening.

The propriety of perineal drainage in this case was considered, and, while his general condition led me to select urethral drainage in preference, I am not so sure now but that the former would have been the better; at all events, I should, in another such patient, adopt the same method that answered so well in the second case. Probably, however, this man's convalescence would have been somewhat tedious under any plan of treatment, for he had naturally poor reparative power, as evinced not only by the behavior of his abdominal wound, but by the fact that for years he had noticed that a scratch or cut would invariably suppurate and be slow in healing.

This case shows that it is possible, in certain conditions, for the retention of a soft and aseptic catheter to produce a suppurative periurethritis without any well-marked antecedent urethral inflammation. Two other points worthy of observation were, first, the presence of residual urine during convalescence, when such had not been detected, though frequently looked for, while the patient was carrying the stone; and, second, the complete restoration of the normal contractility of the bladder after a few weeks' use of the catheter.

In regard to the second case, it might be asked, Why did I complicate the operation with a perineal wound? Why not have depended upon suprapubic drainage, and have made a permanent opening at that point? Had the establishment of a urinary fistula been the ultimate object in view, that would undoubtedly have been the best practice; but the patient could not be convinced that permanent drainage was, or ever could be, a necessity, and obstinately objected to it. My reasons for not suturing the bladder were practically the same as in the other case. I introduced a catheter through a perineal puncture because his pendulous urethra was very sensitive and would not tolerate the retention of a full-sized instrument.

Portions of the tumor were examined by Prof. Ferguson and Dr.

Belcher, and pronounced to be encephaloid carcinoma. The slow progress of the disease, and the absence of a well-marked cachexia after more or less suffering and loss of blood for a period of five and a half years, are unusual features in such a case. It seems probable, however, that this was a benign growth at the outset, and its malignancy a later development. At the present time this patient's condition still remains improved. He has gained several pounds in weight, and can hold his urine for from one to two hours. There has been, however, a slight increase of pain during the last few weeks, and his urine contains more blood and pus.

In conclusion, I believe that in cases similar to these reported in this paper, the best results will be obtained by combining perineal with suprapubic drainage, and withdrawing the suprapubic tube as soon as the condition of the bladder, as indicated by the character of the urine discharged therefrom, will warrant. My reasons for this statement are embodied in the following remarks:

The first desideratum after operation is thorough drainage. In both of these cases I found that in the dorsal position, with the shoulders as well as the head somewhat elevated, the bladder could be kept more completely emptied, and the urine in consequence less offensive and less liable to do harm, than when the patient was upon his side in the position so generally recommended. Again, when the bladder wall is hypertrophied and inelastic, the edges of the wound will lie well in contact with each other without suture, so long as the patient is kept upon his back and his bladder empty. At least, such a natural approximation of the edges of the wound could be well seen in each of these patients; and I believe in such cases it is quite possible, without suture, to secure primary union of so much of the wound as is not held apart by the drainage tube, or kept open by the outflow of urine, pus, or irrigating fluid. In all the reports of cases to which I have access, closure of the non-sutured bladder wound did not occur under three weeks, and generally not for a longer time, where suprapubic drainage alone was relied on. In the second case here reported the bladder wound was firmly united by the fifteenth day, and probably at an earlier date, for no urine passed through it after the seventh, although the catheter was several times occluded and had to be removed and cleansed. Several cases of urinary fistula following this operation have been reported, and they have all occurred, to the best of my knowledge, where the suprapubic tube alone was used. To avoid such an unfortunate result in a case of lithotomy, would in itself be a strong argument in favor of perineal drainage.

Lastly, the comfort of the patient after an operation is worthy of some consideration. For this reason, if for no other, a patient should

not be put in an abdominal position. In the lateral position, with the shoulders elevated, no matter how well the man is supported, he is constantly slipping downwards or backwards, is almost certain to have his dressings and sometimes his clothing wet with urine, and even with frequent changing from side to side he soon finds the position very irksome.

As to the relative merits of urethral, and perineal drainage by Keyes' method, it will be seen from the foregoing remarks that my preference is for the latter. It permits the use of a larger sized catheter with less discomfort to the patient, and I believe is, on the whole, attended with less risk.¹

DISCUSSION.

Dr. ROCKWELL.—During the reading of the paper a suggestion naturally arose in my mind which was finally met in the reader's comments, and that was that the use of perineal drainage, particularly in an old man with chronic cystitis, such as he had to deal with, would be a decided addition to the treatment he has already described. I think the rule in cases of this kind should be that in addition to suprapubic there should be perineal drainage.

As to the question of immediate closure of the bladder wound, it seems to me that the rules in regard to suturing the bladder are not sufficiently formulated to make them so hard and fast that exceptions may not be frequently made to them. Still I think suture of the bladder should generally be adopted with perineal drainage; in the majority of cases I think it would be a decided gain. Of course, if the bladder walls are thickened or diseased, or have been bruised in the manipulations necessary to extract a large stone or tumor, sutures should not be applied.

Dr. PILCHER.—I infer from the manner in which the cases are reported by the reader of the paper that he does not mean to exclude suture of the bladder wound absolutely from the technique of suprapubic operations, but, on the contrary, that he recognizes that it is a proper thing to do in some cases, although in these particular cases which he has reported he judged that it would not be the best thing to do for them, which opinion would doubtless be coincided in by all.

I have been greatly interested in the revival of the suprapubic operation

¹ At the present time, April 10th, Case I. reports that he is in excellent health. The fistula has been closed since March 1st, and there is no residual urine. Case II. remains in about the same condition as when discharged. Urinates every one to two hours, and is better in every way than he was prior to the operation; the results having been more lasting than was anticipated.

for stone in the bladder, and in the probable field which it is to occupy. Certainly, for a large stone such as that which has been presented here, it is greatly preferable to the perineal operation.

In the discussion which has prevailed as to whether, when it was deemed best to use any cutting operation for the removal of a stone, it was not better to have recourse to the suprapubic operation rather than any perineal operation, I have been inclined to give the preference to the suprapubic route, particularly for those gentlemen who do not often have occasion to operate; for I consider that the technique of the suprapubic operation is more simple than that of the perineal operation. While doubtless it is possible for men to go wrong in both operations, I am inclined to think that one with comparatively little surgical experience would be less apt to go wrong in the suprapubic operation than one would in the perineal operation. And still further, that if he did go wrong, he would have much better opportunity to recognize and repair the damage which he had made than is the case when damage is done in the perineal methods. So I have been wont to recommend as the operation of choice, when a cutting operation must be done, a suprapubic rather than a perineal operation.

There are other reasons, aside from the comparative ease and safety of the operation, to which attention has been called by the advocates of the suprapubic operation, viz., the avoidance of injury to the floor of the prostatic portion of the urethra and consequent occlusion of the ejaculatory ducts, which I think has some weight, although perhaps not very much in itself alone.

I have already reported, some three years ago, a case of simple calculus in a young man, in which I performed the suprapubic operation and sutured the bladder, leaving a soft catheter in the urethra for drainage purposes for the first week. At the expiration of that time the union of the suprapubic incision by first intention had been accomplished, and the catheter was removed. On the fourteenth day I had the opportunity to present the patient well and healed before another society.

No case has presented itself to me since, in which I have deemed it best to do this; but I simply refer to it as an example of the manner in which, in a certain proportion of cases, it is proper for us without the perineal opening and with immediate suture of the bladder wound, to secure perfect healing and restoration of the parts to their natural condition in a very brief period of time. In cases where there is an aggravated, offensive catarrhal condition of the bladder, or where there is likely to be a good deal of hæmorrhage and inflammatory reaction as the result of the conditions for which we have opened the bladder and operated, I think I should prefer that a perineal opening for drainage

should be made, such as was done in the second case reported by Dr. Rand. In such cases it might be proper to attempt to suture the bladder wound, that is, the suprapubic wound. I am inclined to think that the best results will often be obtained by making the ordinary median puncture of the membranous urethra and inserting a tube for drainage purposes by that route, and maintaining drainage thus for the first week or ten days, rather than by attempting to introduce a tube through the entire urethra.

I want to congratulate the reader of the paper upon the most excellent results which he is able to report to us in these two most trying and difficult cases.

Dr. ROCKWELL.—If I may be allowed a word. I don't like to have the position which my friend Dr. Pilcher takes—that there is any one standard operation for stone—stand quite unchallenged, for I think that for the competent operating surgeon there *is* a choice of operations. I can appreciate the fact that with men who are not used to perineal operations the suprapubic would certainly be simpler, both for operator and patient. But I think, with competent operators, there are many cases in which the perineal operations are decidedly preferable to the suprapubic. In two of my lithotomy cases, in which I thought it best to remove the stone, for different reasons, by lateral lithotomy, both of them adults, both with comparatively healthy bladders (cystitis being set up simply by the presence of the stone), the results were quite equal to anything attained by the suprapubic. In one case the man was up and reading to his companions in the ward on the ninth day, and went out before the end of the second week. In the other case, an older man, who had been submitted to the same operation, was about the ward by the tenth or eleventh day. In the first case the urine was passed per urethram on the third day and ever after; the wound came together without the slightest trouble.

In cases of medium sized stone, in which the lateral operation can be done, I think it is decidedly preferable to the suprapubic. The median operation is simple, hardly more than a urethrotomy. The lateral operation has its own dangers, and they are recognized by all operators. For a man not in the habit of doing many operations, the suprapubic would certainly be the safer operation; but I don't think, in the present state of our knowledge, we can say there is any one operation for stone. In the majority of cases of large stone, and certainly in cases of tumor and for exploratory purposes, the other operations are not to be compared with the suprapubic. It is the operation *par excellence* for large stone or tumors, and I have seen suprapubic operations for tumors which have been both brilliant and successful, though one very rapidly proved fatal. In all these cases ease of access

to the bladder, freedom of manipulation, and perfect control of hæmorrhage, were very marked, proving, as its advocates claim, that for large stones or tumors it is by far the best operation; but for stones of medium size unsuitable for litholapaxy, I think the perineal operations have their field and will continue to hold it in the future.

Dr. WIGHT.—I have but very few words to say on this subject to-night. I would begin in this way: I am greatly in favor of making a perineal opening in these cases; and while I am about it, I would, as a rule, make it a little larger and take the stone out there. If it was a very large stone, and the patient was in condition, I would operate in the way the Doctor did; but I must say that, as a rule, I prefer the perineal operation. If I should perform an operation like the Doctor's, I should make the drainage as he did. The stone that he removed there is a large one, and was very readily removed from the opening that was made.

In November I operated on an old man about seventy years old; he had been making the stone for twenty-five or thirty years, and was in a most pitiable condition, having chronic peritonitis, and I finally consented to operate on him just so that he would die more comfortably. I had in my mind a suprapubic operation, but I couldn't make it quite agree with my ideas, and so I performed the perineal operation. When I cut down I found, as I expected, a stone that weighed between nine hundred and a thousand grains; I lost quite a little of it by pressure, crushing. The bladder had been inflamed so long that it was soft and thick, almost like granulation tissue, and pieces came away readily from the application of my finger and forceps; and in spite of all I could do I grasped a piece of it as large as my thumb, and it came right off, and the opening that I made readily tore and enlarged. I finally succeeded, after a great deal of trouble, in getting some fragments of it and the stone out. The impression that I had on my mind at the time was that this stone was more or less adherent to this soft tissue. That might have been deceptive, but that was the impression I got.

I expected that the old man would die in a day or two. He was an opium eater, and I gave him opium, for he suffered a great deal of pain. Contrary to my expectation and the expectation of everybody, he slowly improved day after day and week after week, and along in January he went home, down in New Jersey. I haven't heard from him, but I presume he is quite comfortable.

I think in that case, if I had performed suprapubic cystotomy, in his condition, he would have been more sure to die. I wouldn't state that positively, but that is my opinion.

In his case the parts had changed so I had great difficulty in reaching the stone; there wasn't room, so I didn't think it wise to put the crusher in, for the stone was pretty soft, and I crushed it with my forceps. I could think now that if the man had been in little better condition, and that is a certain condemnation of suprapubic lithotomy, I know I could have removed the stone more readily and easily with the hole in front.

I had in my mind to report to this society four of those very singular and difficult cases, which I will at some time, that I have had in the last year and a half.

But I incline to the view that Dr. Rockwell has expressed in this matter. It nearly coincides with my views. I am in favor of perineal cystotomy, especially in cases of small stone, where you can make the incision and pick them out, and they will get well in a few days. But in cases like that which the Doctor has described—it was done with my concurrence—I think his operation was perfectly proper; but I don't think they are all in that line. I think there are some that would be better done in that way and some not.

Dr. ROCKWELL.—Do you intend, when you speak of the removal of small stones, to leave the impression that you would *always* remove small stones by cutting operations?

Dr. WIGHT.—Stones that can readily be removed and crushed. A soft stone I should crush in that way; I should consider my patient rather than the trophy. Any hard stone, if I was convinced it was a hard stone, I should go on and perform simple lithotomy. It is difficult to make a line of demarkation where you would leave one operation and adopt the other. I can see no objection, in the main, to lithotritry. It is a good operation in skillful and careful hands; but my impression is there are a good many recurrences, there are apt to be fragments left; but if those can be excluded, I should be in favor of crushing stones in that way.

Dr. ROCKWELL.—Would not the liability of leaving fragments be quite as great in the cases you have just described as in lithotritry?

Dr. WIGHT.—There is more danger of leaving a fragment in that case than there would be in a perineal section, I think; at least, gentlemen have reported recurrences from time to time. I have known stones to recur in lithotritry, recurring from the original causes perhaps; but it seems to me, as you speak of it, that in many cases great damage has been done to the bladder by those instruments, even in reputable hands, and I know of instances where those operations have been performed and lithotritry has been performed subsequently. I can however conceive, in rarely skillful hands, how it would be desirable in some cases to perform lithotritry.

Dr. ROCKWELL.—I think, as Dr. Wight has said, recurrences after lithotomy are quite as frequent as after Bigelow's operation. I think it a safe assertion to make, that properly performed, no fragments should be left in the bladder. That very small ones can be easily detected is proved by such cases as the following :

I was asked last fall to see a case of stone in the bladder, in a very old man who was suffering intensely. He was unable to attend to his business at all. He was a butcher and resided over his place of business, but felt that he couldn't be divorced from his water closet long enough to make the necessary journey up and down stairs. Most of the time he was obliged to pass his urine while on his hands and knees. When I went to see the case I went prepared to do whatever was necessary. I put him under ether and made a very careful examination, but was unable with a Thompson's searcher to detect the slightest click or feel that any stone was present. The symptoms were very marked, however, and I introduced the large tube of Bigelow's instrument, connected the evacuator with it, and forced into the bladder a bulb full of water, and immediately got the sound of a small stone. I then removed the evacuator, introduced the lithotrite, crushed the stone, and removed all the fragments I could get. They weighed but nine grains while moist, and the man has so far had no recurrence of his trouble. Such a fragment would be a very small one to detect with ordinary exploration, but should not escape discovery during a properly performed litholapaxy. Perhaps, if I had introduced the lithotrite at first, I might have found it, but I think it doubtful ; though I think, if there is a fragment in the bladder, it ought to be found and removed, and that, as a rule, the bladder ought to be left empty, so far as fragments are concerned, after a properly performed operation.

Dr. WIGHT.—I saw a boy three years ago, about ten or twelve years of age, who had passed through a good many hands and who had finally been circumcised for reflex and vesical irritation, and it seemed to me he had stone. I examined in every possible direction and found no stone. I then raised the point of the instrument and pressed the abdomen down, and as soon as I pressed it down I got a well-marked "click" of the stone. I operated, and found a stone about twice as large as the end of my thumb actually hung to the very highest part of the bladder ; the bladder would contract and push it out of the way. I got hold with the forceps, but I couldn't get hold of it in such a way as to remove it. I finally put my forefinger into the bladder and gradually peeled it off, and it dropped into the bottom, and then I could get it out without any trouble. Some of these facts are very difficult to detect.

Dr. PILCHER.—From the remarks made, both by the President and by my colleague, Dr. Rockwell, I am afraid I did not make myself quite clear in the statement of my position as to suprapubic lithotomy. I intended to say that in those cases in which it is deemed necessary to make a cutting operation, not absolutely in all of them, but that as a rule, in most cases, I believe it would be better for the patient if the suprapubic operation was performed. Certainly it is the case that there will be many exceptions to any such general rule; but I think it is a perfectly proper way to express one's self to say that in general the operation of preference, in my opinion of course, would be the suprapubic operation. I realize that a very large number of cases in which, in former times, the cutting operation would have been done, are now taken out of that category entirely, and are being treated by litholapaxy; and that in a certain other proportion of cases, notably where the bladder has been irritated for a long time and is in a condition of chronic purulent cystitis, it is eminently desirable to have a very capacious drainage by the perinæum. In these latter cases, if the stone is not large, it would be better to make simply the perineal opening. When, however, the stone is large, my contention is that a suprapubic opening should be made for its removal and then a perineal opening for drainage. But I am far from wishing to say that there is any hard and fast rule by which all cases must be measured, or in accordance with which they must be done. I strongly deprecate the idea of a surgeon sitting in judgment upon the action of his colleague in an individual case; for the best judgment of every man is always unquestionably given to his particular case, and we must acknowledge that in that case he did what he thought was best. The discussion of principles is another matter.

Dr. WIGHT.—The point there made is an exceedingly good one. While we may criticize the judgment of our confrères, and canvass in a certain way their work, I don't think we are justified in animadverting on their manner. We should respect the best judgment of a surgeon when he comes face to face with a case; that ought to be a final judgment on the case. And we ought not to be sure that we could do any better than others. There is no rectilinear surgery.

Dr. RAND.—This was not intended as a paper upon suprapubic cystotomy, either upon its merits or demerits, or upon the indications for its adoption, but simply a report of two cases in which there seemed to be no question as to the propriety of the suprapubic operation. I had hoped the gentlemen would deal more with the question of after-treatment. So far as I have been able to look up the subject, it would seem to me that, at present, there are some surgeons who claim that in no cases should the bladder be sutured, and there are others

who claim that every case should be sutured, and that in this class only should perineal or urethral drainage be resorted to. I made the point here that, in cases in which we are not justified in suturing the bladder, and there are certainly such cases, we will get more prompt and more favorable results by combining perineal with suprapubic drainage.

PECULIAR ACTION OF POTASSIUM IODIDE IN A CASE OF SYPHILITIC RHINITIS.

BY FRANK P. HUDNUT, M. D.

Read before the Medical Society of the County of Kings, February 19th, 1889.

Mr. D—, aged forty-five, a widower, of sober and temperate habits. Four years ago he contracted syphilis, which ran the usual course. For the past six months he has had more or less discharge from the nose with considerable pain in the frontal region. The discharge was of a greenish color and very fetid at times.

Upon examination, I found a condition of syphilitic rhinitis. The septum was swollen and ulcerated, about an inch back from the meatus. Upon the introduction of a probe, I discovered necrosed bone, and passed the probe into the other nostril through a small opening.

Spraying the parts well with cocaine, I removed, with a dressing forceps, several large pieces of necrosed bone, amounting in the aggregate to the size of a two-cent piece. Upon examining the larynx, found the parts normal, cleansing the nose thoroughly with permanganate of potash, two grains to the ounce, and coating the membrane with iodoform, I exhibited ten grains of the iodide of potash three times a day, and requested him to call again in three days. At subsequent visits I removed more bone, until healthy tissue was reached, but not until nearly all the septum had been removed, the cartilaginous portion remaining intact.

As there continued to be a large amount of matter discharged from several ulcerated spots, I made an application of nitrate of silver, fused on a probe, to these spots, and sprayed the nose with a ten grain to the ounce solution of argenti nitras. After using this solution several times the discharge ceased. As there was considerable hypertrophy of the turbinated bones and some deflection of the septum (cartilaginous portion), I removed the superabundant parts with the cautery and

knife, being careful not to weaken the septum too much. I had been increasing the iodide every visit until he was taking ninety grains a day up to this time (about three weeks).

No symptoms of iodism were observed, unless it was a slight increase in the action of the bowels and an appreciable metallic taste. His general health improved very much, and he expressed himself as feeling very well. After he had been taking the ninety grains of iodide each day for three days, he came to me very much alarmed. I found he had an attack of subacute laryngitis, his voice was very hoarse, and his larynx very much inflamed. After cleansing the parts well with Dobell's solution, I sprayed the larynx with argenti nitras, 20 grains to the ounce. Continuing this treatment for several days and finding no improvement, I decided to stop the iodide and see what effect this would have. On going three days without the iodide, I noticed a decided improvement in his condition. Being aware of the fact that iodide would produce coryza, and in some cases a slight laryngitis, I became very anxious to find out if the iodide was producing the irritation. In order to decide this, I directed him to resume the iodide again in the same doses as before, and to report in three days. In the meantime I gave him no treatment.

Upon the next visit I found him even worse than at the beginning of his trouble; he could not speak above a whisper. I then stopped the iodide entirely, giving no treatment. In three days he was much better, and at the end of a week he was well. I then reduced the dose to ten grains three times a day, and since then he has had no trouble.

In looking up the effects of iodide on the larynx by various authors, only slight reference is made to the action of the iodide on the larynx, and then only when iodism has been produced. Bartholow describes it as a hoarseness and accompanied by coryza, with a rise of temperature. I cannot but feel in this instance that the inflammation of the larynx was entirely due to the iodide.

My object in making note of this case was to draw your attention to the liability of throat complications when using iodide in the treatment of syphilitic affections. Of course the danger is very slight and you might treat many cases without finding one presenting similar symptoms; still, it is well to bear in mind the danger of such complications.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

THE DR. DANIEL AYRES FUND.

The most interesting feature of the annual dinner of the Alumni Association of the Long Island College Hospital was the gift by Dr. Daniel Ayres of \$10,000 to the Hoagland Laboratory. Although Dr. Ayres is not a graduate of the College, still he is an honorary member of its Alumni Association, and we presume that the generous donor will not object to permitting the Association to bear some share in the honor connected with such a donation. That the Alumni appreciated the gift was abundantly demonstrated by the outbursts of applause which followed its announcement.

The Directors of the Hoagland Laboratory held, on the 23d inst., a special meeting to take action in the matter, and adopted resolutions expressing appreciation of the gift, and their decision to make of it a permanent fund, to be known as the "Dr. Daniel Ayres Fund," and to spend only the income. This action is worthy of commendation. It insures the permanency of the fund, and that the name of its founder will be inseparably associated with the Hoagland Laboratory so long as it shall endure. The following are the resolutions:

WHEREAS, Daniel Ayres, M.D., of this city, did, at the dinner of the Alumni Association of the Long Island College Hospital, make a donation of \$10,000 "to help along the work of the Hoagland Laboratory;" therefore be it

Resolved, That this generous contribution is received with mingled feelings of sincere gratitude and gratification; of gratitude for the material aid in carrying forward a work designed to more fully equip the members of the medical profession for their important duties, and of gratification that the wants, work and worth of the Institution, so early in its history, should be recognized, and so generously appreciated by one of such mature judgment, and such high professional and scientific attainments as the worthy donor.

Resolved, That the donation shall be named the Dr. Daniel Ayres Fund, and shall be kept securely invested, and the income only expended, in the manner indicated in the donation.

Resolved, That Dr. Daniel Ayres be furnished with a copy of the above preamble and resolutions.

C. N. HOAGLAND, }
CHAS. H. HALL, } *Committee.*

SPECIALISM.

Specialist in "pleural pneumonia and pulmonary troubles," "also every description of skin diseases," "old sores of 30 years," etc., etc., is the announcement made in a circular which has been sent a practitioner of this city, signed by one who "has been in successful practice and a Regular Graduate and Registered Physician of New York," but who has now located himself in Brooklyn. In this circular letter to his professional brethren he informs them that if they have any patients they cannot devote the time to or "do not desire to treat of these diseases given above," they may be conscientiously intrusted to his care for a permanent, successful cure. This he further informs the profession is brought about by "an Effective, Direct and Pleasant Application to the Lungs and General Circulation of Blood."

It should be a matter of no little congratulation to Brooklyn physicians that one who is confessedly so skilful in his specialties should be willing to leave a successful practice in New York, and come to Brooklyn to relieve his professional brethren, who are so occupied that they have not time to treat "pleural pneumonia," "pulmonary troubles," or even "skin diseases." It manifests a true missionary spirit on his part, and if he does not receive his reward now, he undoubtedly will in the future. It was hardly necessary for him to tell us that he was a "Regular Graduate"; his action would have shown that. Surely no irregular practitioner, no quack or charlatan, would evince such a self-sacrificing disposition as he has shown in his relinquishment of his large practice in New York to come to Brooklyn, not only to aid a profession which is overworked, but even one to which some kinds of professional work are distasteful. Another proof of his regularity is seen in the number of specialties which he has adopted. Most men are satisfied with a single specialty, believing that an ordinary mind has about all that it can grasp to master that; and this is undoubtedly true. What must be said then of a mind which contains so much knowledge as to enable its possessor to become a specialist in "all diseases of the throat and lungs;" in "rheumatism, malaria fever, and every description of skin diseases;" in "sprains and old sores of 30 years"; and in "fungus growths"! Surely such a mind must be colossal, and the body which contains it the very acme of regularity.

Our New York brother evidently distrusts the perceptive powers of Brooklyn physicians. He seems to fear lest these proofs of his skill, his learning and his disinterestedness may not be convincing, and he therefore states that he can give the "highest living References and Testimonials." A living testimonial would in itself be a great curiosity, how much more so the highest of the species!

The author of the circular referred to reminds us of a judge, of whom some one in describing his qualities said to a member of the bar: "Did you know that Judge B—— was one of the most learned judges in the State?" The lawyer looked in astonishment and replied: "No, I did not, and I think you would have hard work to prove it." "But," the answer was, "it is not necessary to prove it, he admits it."

SOME RELATIONS OF SCIENTIFIC EXPERTS TO THE ADMINISTRATION OF THE LAW.

We commend to our readers the admirable address of Justice Wil-
lard Bartlett, which we publish in full in this number of the *JOURNAL*.
To one portion of the address we desire to call the especial attention
of the profession, as we believe if the advice therein given were to be
followed, much of the opprobrium would be removed which now
attaches to the medical expert; it is as follows:

"Upon the trial, except in the comparatively rare instances in
which there is no dispute as to the nature, extent, and consequences
of the plaintiff's injuries, the respective parties are assisted by physi-
cians or surgeons, or both, who testify in reference to these matters,
and often advise counsel as to the conduct of the medical or surgical
part of the case.

"The wise doctor, as it seems to me, will take care not to act in
both capacities. If he is to testify in the case, he will not act as
assistant counsel; if he acts as assistant counsel, he will keep off the
witness stand. There is no good reason why the most distinguished
physician should not place his professional knowledge and experience
at the service of one of the parties to a litigation which involves ques-
tions of medical science. To do so cannot justly subject him to
reproach; but it does lessen his fitness and his usefulness as a witness
in that litigation. In assisting counsel, he will inevitably come to
share the sentiments of counsel as to the result. Just as counsel will
seek to bring out every fact that may prove beneficial to the cause of
his client, and will endeavor to destroy, as far as may be, the effect of
any proof which is injurious to him, so the medical man thus em-
ployed will suggest questions for the examination of witnesses on the
other side, which will call out answers favorable to the party at whose
instance he has been brought into the case. All this goes on before
the jury, who fully comprehend where the medical questions really
come from. If, afterward, they see the doctor take the witness stand,
it is impossible that they should regard him as otherwise than preju-

diced. However truthful his testimony may be, and however correct his opinions, his evidence is the evidence of a partisan, and this fact invariably detracts from its force and effect."

The plan which is followed in Leeds, to which Justice Bartlett refers in his address, seems to us to be an excellent one, well adapted to produce the best results. Can not such a method be instituted here, and will not the Medical Society of the County of Kings be the first to take the initiatory steps? The JOURNAL will be only too glad to receive suggestions from any source which will tend to bring about such a result.

SIR EDWIN CHADWICK, K. C. B.

The Queen of England has somewhat tardily put her official stamp of honor on a very honorable man, the noble sanitarian Chadwick, who has but recently celebrated his ninetieth birthday, by the bestowal of knighthood. But Sir Edwin Chadwick has been a knight all his life long, having allied himself to nearly every reform in his country that has taken shape during the last sixty years, and having been a leader in many of them. His lofty character and philosophic brain have been in the service of the poor and unfriended classes from the outset of his career. He has been called "the greatest sanitarian of the time," and it has been said of him, by no less an authority than Dr. Alfred Carpenter, that "by his labors he had saved more lives to his country than any man living." Although a lawyer by profession, his life-work has brought him more frequently into association with medical than with legal minds, and the former will especially rejoice with him that the labors that make for peace and lengthened days have not been wholly overlooked by the official dispensers of honors.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

At the May meeting of the Society Dr. L. S. Pilcher will read a paper on "Abscesses of the Frontal Sinus," and Dr. Hubert Arrow-smith one entitled "Some Observations on the Climate of Colorado." Members intending to discuss either of these papers will please send their names to the President, A. Ross Matheson, M.D., 337 Union Street.

The Medical Society of the County of Kings will be represented at the coming International Exhibition in Paris by a full set of the Proceedings, 8 vols., 1876-1883, and a set of the BROOKLYN MEDICAL JOURNAL.

OBITUARY.

Almon S. Allen, M.D., was born at Petersburg, N. Y., Nov. 21, 1847, being the son of Dr. A. N. Allen, late of Pittsfield, Mass. He was a graduate of the Albany Medical College in 1872, and served a year as interne at the Albany City Hospital. In 1874 he settled in Stratford, Conn., and was successful there; but in 1881 he was led to make a change to a city practice, coming to Brooklyn. In January, 1888, failing health obliged him to remove to a more congenial climate. He went to Southern California and to Arizona, having the strength to do some professional work; but his trouble, pulmonary phthisis, did not yield, and he decided to return to his home in January, 1889. About two months of lingering and suffering were confronted by him with Christian fortitude until the end came, on March 17, 1889.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

The regular monthly meeting of the Medical Society of the County of Kings was held at the rooms of the Society, 356 Bridge Street, Tuesday evening, March 19, 1889, at eight o'clock.

The President, Dr. A. Ross Matheson, in the chair.

There were about fifty members present. The minutes of the February meeting were read and approved.

The Council reported favorably upon the following applications: Drs. Geo. H. Parshall, D. W. Waugh, Otto E. F. Risch, Hubert Arrowsmith, and W. F. Gardner, and recommend them to membership.

The President declared Drs. F. A. Hesler and Dwight B. Taylor duly elected members of the Society.

The following propositions for membership were offered: Drs. J. H. E. Sands, 947 Fourth Avenue, University, City of New York, 1886; proposed by Dr. A. Ross Matheson, indorsed by Dr. Myerle. Jas. F. McGraw, 130 Gold Street, Coll. Phys. and Surg's, Baltimore, 1879; proposed by Dr. Wm. Maddren, indorsed by Dr. Lucas Victor A. Robertson, 777a Union St., Coll. Phys. and Surg's., N. Y., 1883; proposed by Dr. Maddren, indorsed by Dr. Lucas. Henry L. Grover, 881 Quincy St., University City of New York, 1886: proposed by Dr. H. C. Matthews, indorsed by Dr. C. E. Perkins. Stanley G. Clark, 132 Reid Avenue, University City of New York, 1868; proposed by Dr. W. B. Chase, seconded by Dr. Matheson. Jeremiah Koehl, Hewes Street, Jefferson Med. Coll., 1868; proposed by Dr. J. L. Kortright, indorsed by Dr. Myerle. Robert A. Black, 278 Bridge Street, Coll. Phys. and Surg's., N. Y., 1883; proposed by Dr. Geo. Drury, indorsed by Dr. Maddren.

SCIENTIFIC BUSINESS.

The first paper of the evening, "Vertigo," was read by Dr. John C. Shaw.

Discussed by Drs. William Browning, T. M. Rochester, J. H. Raymond, Walter B. Chase, W. Bliss, George G. Hopkins, William Maddren and Eliza M. Mosher.

The second paper of the evening by Dr. George McNaughton, entitled "A Case of Primary Cancer of Pancreas," was read, and dis-

cussed by Drs. Hopkins, Browning, Shaw, Raymond and McNaughton.

There being no reports of committees or unfinished business, on motion the meeting adjourned.

DAVID MYERLE, M.D.,
Ass't Sec'y.

BROOKLYN SURGICAL SOCIETY.

Meeting of March 7, 1889.

Dr. Rand presented a patient with paralysis of the musculo-spiral nerve of the left arm.

The child, now three months old, came to him two months ago with complete pronation of the forearm and wrist drop. These symptoms were noticed at birth. There was no history of injury, and repeated examinations failed to show any lesion of bone or joint. When the child was born the cord was wrapped twice around the arm and once around the neck. The arm was quite deeply creased, and the mark remained for a week or ten days plainly visible to the parents. Prolonged pressure of the cord upon the nerve was the only cause to which he could ascribe the present symptoms. The arm had very much improved under treatment by the interrupted current and massage.

Dr. PILCHER.—I saw this winter a case which, in some respects, is similar to this—a child in whom certain muscles of the arm, especially the deltoid, were paralyzed. It couldn't raise its arm after birth for some weeks. The gentlemen who attended the labor stated that there had been pressure, somewhat prolonged, of this shoulder against the pubic arch during delivery. This pressure upon the deltoid muscle in my judgment, was the cause of the paralysis, from which gradual recovery occurred.

I can conceive that, just as a man will sometimes lie down with his arm under his head, and, from pressure upon his forearm may produce a temporary paralysis of the supinators and extensors of the forearm from pressure upon the musculo-spiral nerve, so in cases like the one presented by Dr. Rand, we may have paralysis of these muscles from a close wrapping of the cord around the arm.

Dr. WACKERHAGEN.—I have not seen a case similar to this in the forearm, but I have seen one exactly like the one related by Dr. Pilcher, which recovered without any treatment at all in about seven or eight months.

Dr. WIGHT.—In the course of many years' experience I have seen several cases of paralysis of parts of the upper limb in infants and children. While I think the explanation in this case is very ingenious, and may be true (and I am not at all prepared to say it is not), I have generally put such cases in the category of infantile paralysis. I have noticed that they generally improve more rapidly than cases of the lower limbs. I should incline to look to the same source of origin, which is, to a certain extent, unknown. I can see how the twisting of the neck might interfere, but that is not a direct cause. I have never been able to do very much for them, but they have usually gradually improved. I would suggest that this might have been, possibly, in the line of infantile paralysis; but, at the same time, I am greatly impressed with the Doctor's explanation in this case, and it may be true.

Dr. RAND.—It seems to me that a strong argument in favor of my explanation of the case would be that the paralysis is so localized, confined exclusively to those muscles supplied by the musculo-spiral nerve and not involving the muscles of the shoulder.

Dr. WIGHT.—If I was impressed rightly in examining the arm, the deltoid in this case is not so large as on the other side, and that may be due to the contributory cause that you speak of. I only suggest the other possible explanation.

Dr. ROCKWELL.—It is an interesting physiological fact that so prolonged pressure on the arm should not have interfered with its circulation.

Dr. RAND.—The babe was asphyxiated when born, although labor was of short duration. I do not depend merely upon the statement of the midwife who delivered the child, but also upon the statement of the mother and grandmother, which was that they not only saw the cord unwound from the arm, but that the crease made by it remained one or two weeks; so that the intrauterine pressure of the cord must have existed for some time, not enough to interfere seriously with the circulation of the cord, but enough to interfere, by its long continuance, with the function of the musculo-spiral.

Dr. Rand also presented a calculus taken from the urethra of a man who came to him claiming that he had stricture. When the patient tried to pass water the urine bubbled from the meatus without force. On examination a hard mass was found occupying the fossa navicularis, which the probe demonstrated to be a stone. This was removed with a loop of wire, after enlarging the meatus, it being found impossible to extract it with forceps without damaging the glans or producing a hypospadias. The calculus was seven-eighths of an inch long and one-half an inch wide, being somewhat almond shaped.

LONG ISLAND COLLEGE HOSPITAL.

The closing exercises of the winter session of the Long Island College Hospital occupied portions of three days, March 12, 13 and 14.

The Association of the Alumni met at the college on the afternoon of the 12th, Charles E. De la Vergne, M.D., President, in the chair. After the reading of the minutes and the report of the Board of Managers by the Secretary, H. Messenger Ayres, M.D., the Treasurer, C. N. D. Jones, M.D., read his report, showing that the receipts for the year had been \$948 53.

The committee, consisting of G. R. Butler, M.D., and J. H. Raymond, M.D., who had been appointed at a previous meeting to request of the Board of Regents that the Association of the Alumni be granted a representation in the Board, reported that they had appeared in person before the Regents, and presented the request of the Association, and that in response thereto the following communication had been received :

LONG ISLAND COLLEGE HOSPITAL, }
BROOKLYN, N. Y., Dec. 13, 1888. }

Gentlemen:—In conformity with the instructions received, I beg leave to hand you herewith a transcript from the minutes of the Board of Regents of the action taken by the board, at the meeting of the 3d inst., with reference to a communication presented by you to the Board some time ago, on the part of the Alumni Association.

Very respectfully,

F. W. KEUTGEN,

Secretary pro tem.

Dr. JOSEPH H. RAYMOND, }
Dr. GLENTWORTH R. BUTLER, } *Committee.*

To the Board of Regents:

The committee appointed to consider the communication of the Alumni Association, respecting the representation of that body in the government of the institution, respectfully reports :

Under the acts incorporating the college and the acts amendatory thereof the members of the Board of Regents are elected from the incorporators, and any member of the Alumni Association, who is an incorporator, is eligible to membership in the Board of Regents. If the name of any incorporator is submitted to the Board of Regents by the Alumni Association it would doubtless receive respectful consideration.

Under existing laws it is impossible to elect a member of the Board of Regents in any other way.

On motion the report was adopted, and the secretary *pro tem.* instructed to forward a copy thereof to the committee of the Alumni Association.

[True copy.]

F. W. KEUTGEN,
Secretary pro tem.

The report of the committee was received, and the committee discharged with the thanks of the Association.

An invitation was received from Dr. C. N. Hoagland, President of the Board of Trustees of the Hoagland Laboratory, to visit the laboratory. The invitation was accepted.

George M. Sternberg, M.D., U.S.A., General Director of the Hoagland Laboratory, and George T. Kemp, Ph.D., Associate Director in Physiology and Bacteriology, were elected honorary members of the Association.

Z. T. Emery, M.D., class of 1874, was unanimously elected by the association for presentation to the Board of Regents as a member of the corporation of the Long Island College Hospital, to represent the Association of the Alumni, and the Secretary was directed to forward the name of Z. T. Emery, M.D., to the Board of Regents, in accordance with the suggestions made in the communication of December 13, 1888, and the Treasurer of the Association was instructed to pay to the treasurer of the corporation \$50, as required by sec. 2, chap. 7, laws of 1881, which says :

“§2. Any person, on payment of \$10 annually for five successive years, or of \$50 within that period, to the treasurer of said corporation for the use thereof, may become a member thereof, and be entitled to vote at any election to be held, in virtue of this act, at any time after the payment of ten dollars, provided his name shall have been proposed to the Board of Regents at a regular meeting thereof, and been approved by a majority of the members of said board present at the next regular meeting thereafter.”

The Corresponding Secretary, R. L. Dickinson, M.D., reported that there were 847 names on the active list of membership.

The election of officers for the ensuing year resulted as follows : President, F. H. Colton, M.D., class of '64 ; Vice-President, P. H. Kretzschmar, M.D., class of '77 ; Secretary, H. Messenger Ayres, M.D., class of '80 ; Corresponding Secretary, G.W. Brush, M.D., class of '76 ; Treasurer, C. N. D. Jones, M.D., class of '82.

Councillors : C. E. De la Vergne, M.D., F. E. West, M.D., H. L. Cochran, M.D., J. H. Raymond, M.D., Z. T. Emery, M.D., and W. L. Carey, M.D.

The Association then adjourned to meet at Remsen Hall, for the annual dinner, at 7 P. M., March 13th.

ANNUAL DINNER.

The ninth annual dinner of the Association of the Alumni took place at Remsen Hall, on the evening of March 13th. One hundred and fifty members and invited guests were present. Among the invited guests were the Hon. Alfred C. Chapin, Mayor of the city of Brooklyn ; the Hon. Calvin E. Pratt, Justice of the Supreme Court, and Professor of Medical Jurisprudence in the College ; Gen. A. C. Barnes, Hon. A. G. Hull, Daniel Ayres, M.D., LL.D., formerly Professor of Surgery in the College ; Rev. Dr. Lyman, Mr. W. A. Purrington, and members of the Board of Regents.

At the close of the dinner, which was an excellent one, and reflected credit on the caterer, the president, Dr. De la Vergne, said that it was not often that doctors had a good square meal—office hours were too intimately blended with meal time. But to-night they had leisure, and having finished their dinner and coffee it was proposed to have a social chat, cigar in hand. The past year's work had been successful, and there was a larger number present than at any previous dinner of the alumni. The Faculty had given some privileges to them, and the Board of Regents had favorably considered their application to be allowed to send a representative to that body. Dr. Z. T. Emery had been selected for the position, and it was only a question of a short time when he would become a member of the Board. Dr. De la Vergne referred feelingly to the principal founder of the association, Dr. George H. Atkinson, who had laid down his life for his profession, and who, had he lived to see the result of his efforts, would have felt he had accomplished a good work.

There had been conflicts between religion and science, but no one had ever heard of a conflict between a minister and a physician, and it gave him pleasure to introduce the Rev. Dr. Lyman as the first speaker of the evening.

Dr. Lyman said he supposed dissection preceded digestion, and that the scientific evolution of this banquet had probably begun with a clinic at the Long Island College Hospital. Hard work deserved a good time. The Long Island College Hospital deserved the unqualified honor of everybody. Cities grew and professions grew with them, and it was fitting that brotherhood should obtain among the profes-

sions. One of the proudest stars in the diadem of the College's public renown was that it antagonized no other institution. Christianity and science were not enemies. Law, physic and theology stood together to fight the devil. Theology admonished him ; Judge Pratt punished him, and the doctors cured him. Religion and science must stand together. There must be thoroughness first, then fidelity and generosity. Faith cure and Christian science were two legs, but represented an awful straddle. Quackery lived with one foot in the United States and the other in Canada. A concrete doctor and a concrete minister should pull together. Every man should stand up for what he represented. Charity, candor and conviction were essential to the clergyman. Charity must grow and harden or there would be no manhood. The speaker stood up for manhood. Let there be manhood, charity and conviction, and God Almighty will take care of the rest.

President De la Vergne then introduced Mayor Alfred C. Chapin, as a man who has made a record for himself in the government of the State as well as in the municipality, and who was scoring a greater record for himself as a friend of the poor physicians by making the city streets safe for them to drive through. The Mayor was received with loud and long continued applause. He thanked the president for the method of his introduction and the company for the reception given him. It was not surprising that doctors were hospitable, and he did not share the impression that they were only to be associates more or less with an event which often followed much sorrow and suffering ; he believed that physicians should be associated with health. He approved of the engraving on the menu. It represented Æsculapius sitting with a young woman, who might be Greek, but who was good looking enough for a Brooklyn girl. About twelve months ago he had arrived at that age when it had been said a man was either a physician or a fool. As he was not a physician, he was led to ponder. He had asked himself what a man should be at two-score, when he had shed many young ideas and looked upon the world with experienced eyes.

"When a man has attained the age of forty years," said the Mayor, "he is supposed to have reached a period of fulness and just judgment, if he ever can attain such development. It is fitting to compare such a man with a physician. We are charged, as a people, with being given up to sensationalism, to the desire for ever-changing novelty from day to day. That charge has been brought against every age. But it may be acknowledged that as a people becomes more generally educated there is a greater appetite for novelty, more of an aptitude to be swept by gusts of fancy and capriciousness. The press caters to this taste, and furnishes an illustration of its existence. But if there is any class of people that is free from this it is the physicians. They

give up ten years of their life to self denying work before they can reap the benefits of their profession. But that is not all that is given by those who enter it. The young lawyer has the reward cheaply earned of declaiming before crowds and of all the publicity to which he may care to give himself. The doctor denies himself all of this. He is without obtrusiveness. He is bound by the rules of his profession not to advertise himself. Other business may be pushed into great profits and success by advertising, but his not. The doctor has committed himself to stand on his own merits. It has always struck me as a strong character in the physicians as a class—their serene intelligence. They are fittingly compared to a man of forty—to a full character of manhood. It certainly is desirable that the physician should not be jolted and jarred while driving to his patients. He should reach them in a condition to give them the full benefit of his skill.”

Gen. A. C. Barnes was called upon to speak on the subject of the educational interests of Brooklyn. He said that the magnificent public school system reflected credit upon its founders and upon the present Board of Education. The Packer, Adelphi and Polytechnic are unrivalled in the country. They give a practical education as well as the supplementary finish. New York, which displays a tendency to look down upon Brooklyn, has no such institutions of learning. The schools of special training, to which a Pratt and a Hoagland have given names that will ring forever in the annals of public institutions, can not be surpassed. The mission of the physician is a noble and a God-like one; one of the names given to the Savior of mankind is that of the Great Physician.

Judge Pratt was the next speaker, and was warmly received. His experience with the medical profession, he said, had always been that of a patient. People go to sleep at night happy in the consciousness that the ever-prevailing influence of the law will protect them. They do not look into the causes of this, but simply at the results. The same might be said of the influence of the medical profession. The science of medicine has thrown about the civilized world a protection against diseases and epidemics. There is no question but that the educated physician is one of the best friends of mankind. He is faithful, constant and sincere.

W. A. Purrington, counsel for the New York County Medical Society, followed, giving an account of the work of the society, of which he was the counsel, in prosecuting quacks. He considered the quack with a diploma far more dangerous than the one without. What every medical college in the country should aim at over and above everything else was a high standard, and the alumni should aid the Long Island College in achieving this end.

Dr. Daniel Ayres, an honorary member of the Association, was then called upon by the president. He congratulated the members of the graduating class that they had been permitted to pursue their medical studies in such an age of progress. He contrasted the opportunities which the Long Island College Hospital now offered its students with those which it was able to give them years ago. Of all the improvements made, none appealed more strongly to his sympathy and admiration than the Hoagland Laboratory, and no one could foresee the benefit which it would be to medical science, and especially to the students of the Long Island College Hospital. He desired to show to Dr. Hoagland his appreciation of the noble building which he had founded, and wished, through the president of the Association, to offer a humble contribution to the future work of that institution. He hoped that this would act as a stimulus to others to do the same. As Dr. Ayres finished speaking, he handed Dr. De la Vergne a piece of paper, which the president announced was a cheque for \$10,000, payable to the treasurer of the Hoagland Laboratory. In a moment the wildest enthusiasm prevailed, and cheer upon cheer was given for Dr. Ayres. On receiving the cheque, Dr. Hoagland said that no words could express his feelings. The gift to the Laboratory was entirely unexpected, nor had he received the least intimation of it. He thanked Dr. Ayres most heartily for his sympathy in the work of the Laboratory, and for the generous contribution which he had made.

Dr. Alexander Hutchins, member of the Council, who was next called on, referred in graceful and well-chosen terms to the magnificent gift, and to the uses to which it could be applied. He anticipated the time, also, when the faculty of the Long Island College would hold their position on life tenure, and, independent of pecuniary considerations, devote their whole time to the advancement of medical science.

Dr. J. H. Raymond was called on to speak for the faculty. He said that the faculty recognized the great assistance which the College received from its alumni, and felt that on such an occasion as this a report of what it was doing was due to the members of the Association. At the request of the faculty the Board of Regents had abolished all fees to the alumni of the Long Island College Hospital, so that they could enjoy all the advantages which the College and Hospital afforded without any cost whatever. The College was in a most flourishing condition. The class of 1888 numbered 167 members, and although the collegiate year was not yet closed, there was every indication that the class of 1889 would be still larger. The number of graduates this year would be 47. Since 1860, when the first instruction was given, there have been 3,081 matriculants, of which 1,135 graduated. The first class in 1860 numbered 58 students, of which 21 graduated. In

1862 there were but 34 students and 11 graduates. Of the 1,135 graduates 1,078 were Brooklynites. The percentage of Brooklyn men who have received their duly signed commissions to practice was 20 in 1860; 11 in 1868; 50 in 1883, and 60 in 1888. During the existence of the College there have been 2,003 students from out of town. In order to demonstrate the benefit the College has been to the city, the speaker stated that the non-resident students have paid in board alone over \$200,000, while the total amount of money which they had brought to Brooklyn and left here was \$700,000. During the past three years, out of 500 students, but two have left to take medical courses elsewhere, and in both of these cases the families of the gentlemen had moved away and they left the College in order to accompany them. Among the students of this year are representatives of Scotland, West Indies, Liberia, China, Germany and England.

Mr. Lawrence Coffin, of the graduating class, responded for the class, all of whose members were present, and Dr. John Harrigan to the toast of Woman. At a very early hour on the morning of the 14th the president dismissed the banqueters.

THIRTIETH ANNUAL COMMENCEMENT.

The commencement exercises were held at the Academy of Music on the evening of March 14th. The following was the order of exercises:

ORDER OF EXERCISES.

Overture,	-	-	-	"Hungarian Comedy,"	-	-	-	Kela-Beler.
Grand March,	-	-	-	"American Centennial,"	-	-	-	Eben.
Prayer,	-	-	-	-	-	-	-	By Rev. Cornelius Wells, D.D.
Music,	-	-	-	"L'Etoile du Nord,"	-	-	-	Meyerbeer.
Presentation of Candidates for Graduation. By Prof. Jos. H. Raymond, Secretary of Faculty.								
Hippocratic Oath Administered. By Prof. A. J. C. Skene, Dean of the Faculty.								
Conferring of Degrees and Prizes. By George G. Hopkins, M.D., of the Board of Regents.								
Music,	-	-	-	"Paraphrase,"	-	-	-	Goetze
Valedictory,	-	-	-	-	-	-	-	By Carlos Alvarez De la Mesa.
Music,	-	-	-	Selection, "Falka,"	-	-	-	Chassaigne.
Address to the Graduates. By Rev. L. I. Chamberlain, D.D.								
Benediction. By Rev. Cornelius Wells, D.D.								
Music,	-	-	-	"Defilant,"	-	-	-	Arban.

The officers of the class were: Class President, George Deverell Barney; Vice-President, Charles Albert Briggs; Secretary, Ralph Hayward Pomeroy; Treasurer, Adam Henry Straub; Class Committee, Richard M. Bradbury, chairman, and Wilbur H. Bliss, Lawrence Coffin, Eugene J. Kenny, Charles H. Jones, John Alexander Lyons. Edward C. Branch acted as chief usher.

ADDRESS OF THE VALEDICTORIAN.

Dr. C. A. De la Mesa, of the graduating class, delivered the following address, entitled "Some Elements of Success."

The tendency of modern pathology is to attribute many forms of disease to the presence of germs. To discover these germs and the means of destroying them would constitute an effective method of treatment.

The discovery of the germ of failure in life and the means of its destruction would furnish the secret of success.

Of all the men who enter mercantile pursuits, it is said, that only a small percentage escapes bankruptcy, or having once failed retrieve their fortunes. A similar statement would hold good in regard to the various professions.

It is not pleasant to believe with Emerson that "the key to all ages is imbecility, and that what gives force to the strong, is that the multitude have no habit of self-reliance or original action;" but it is not difficult to accept his other saying that "society can never prosper, but must always be bankrupt, until every man does that which he was created to do."

Here is our definition of success. The doing of that which we were created to do.

This is the touch-stone by which the world judges a man's life. It asks, what has he accomplished, refusing to make fine discriminations, and to enter into that nice balancing of motive which might be deemed indispensable by the philosophical observer of character. Of course, the modifying influences of birth, natural abilities, educational advantages, social environment, render successes comparative, and of varying degree. One is successful if he makes an honest living; another adds something to the commonwealth. One builds a fortune, a second builds a character, a third builds both. One man exerts an influence in the community which helps others forward, while still another achieves greatness and becomes the cap-stone of his age.

To no other cause, perhaps, is failure so frequently to be traced as to a mistaken calling.

There are men who possess an amount of inherent ambition, energy and dogged determination which will insure success in any walk of life. They are human corks. Thrown into the stream of the world's activities, the buoyant instinct so permeates their nature that they will no more sink than a cork or a kitten. Others there are, by far the majority, who utterly fail in any calling other than of their own choosing. Let every man study his aptitude. He must follow the bent of his own inclination if his work is to glow with the fire of originality and be marked with the stamp of success.

After a man has wisely chosen his calling, the prime requisite is constitutional talent, by which is meant the vigor imparted to a man's ideas by a strong *physical* constitution.

It is an old but true saying that "a pound of energy and an ounce of talent will accomplish more than a pound of talent and an ounce of energy." Just as a strong physical constitution enables the body to resist disease or to rally from its effects, so it lends the spirit the power to overcome obstacles and to bear up against adversity.

Another indispensable element of success is concentration, or devotedness to one object. What is more powerless than scattered clouds of steam? But these same vaporous clouds when concentrated and held within bounds are able literally to move mountains. So it is with the man who scatters himself upon many subjects—he soon loses his energy and with his energy his enthusiasm; and how is success possible without enthusiasm?

Of all the elements of success none is more important than self-reliance:—a determination not to depend upon others. Help from within will always strengthen, while dependence upon help from without invariably enfeebles.

Emerson says: "There is a time in every man's education when he arrives at the conviction that envy is ignorance; that imitation is suicide; that he must take himself, for better, for worse, as his portion; that though the wide universe is full of good, no kernel of nourishing corn can come to him but through his toil bestowed on that plot of ground which is given him to till." The marvelous success of Napoleon was but the outgrowth and direct result of that spirit which enabled him to say: "There is nothing in war which I cannot do by my own hands. If there is nobody to make gunpowder, I can manufacture it; the gun-carriage I know how to construct. If it is necessary to make cannons at the forge, I can make them; the details of working them in battle if it is necessary to teach I shall teach them."

Cultivation of system as an element of success is not to be overlooked; for it matters not how clever or brilliant a man may be, or how fertile in expedient, if he work without system, catching up whatever is nearest at hand or trying to do many things at once, he will surely, sooner or later, come to grief; and just so surely will the man who works on with steady methodical industry succeed.

When Lady Macbeth was urging on her vacillating husband to the commission of the crime from which even his soldierly heart recoiled, she gave utterance to a motto every young man may well inscribe upon his shield as he goes forth to the battle of life: "But screw your courage to the sticking place and we'll not fail."

Courage—persistence; these are the qualities which crown all the rest. The courage that dares all because conscious it *can*, and like Cortez, burns its ships behind it. A tenacity of purpose like that of Palissy, or Jenner, or Columbus; which will face starvation, endure ridicule, brave dangers of the untried ocean; but will not yield nor falter until its purpose is accomplished. And yet,

“Let him not boast who puts his armor on,
As he who puts it off, the battle done;
Study yourselves; and most of all, note well,
Wherein kind nature meant you to excel.
Write on your doors the saying, wise and old,
Be bold! be bold! and everywhere be bold!
Be not too bold! Yet better the excess,
Than the defect, better the more than less;
Better, like Hector, on the field to die,
Than like a perfumed Paris turn and fly.”

Gentlemen of the Board of Regents:—It is my privilege this evening to say the word of parting to you on behalf of the class of '89, and that word is an earnest wish for your welfare and that of the institution over which you preside.

We know that the advantages we have enjoyed are greater than those afforded students who have preceded us by even a few years, and we desire that those who follow us shall have still greater facilities.

In all sincerity we assure you of our appreciation and esteem. We are ambitious for the college from which we have just been graduated, and pledge you our co-operation in your efforts to further the interests of our alma-mater.

In taking leave of you, Gentlemen of the Faculty, we desire to express our sense of obligation for your earnest individual efforts to instil into us important principles.

May your words of advice and the truths you have furnished us as the result of your research and experience, ever remain with us.

To you we are indebted for the development of many of the elements of success, for, our concentration of thought and devotedness to the study of medicine are incited and fostered by your unremitting system of quizzes.

The practical application of theory has been thoroughly illustrated by the methods employed in your instructions.

To hear a lecture on a given subject, afterward to be persistently examined upon it; anon to be brought to the bedside, and there have pointed out to us by a painstaking professor, the characteristic appearance of the patient, the signs and symptoms of the disease, then to

to have indicated the diseases which closely resemble the existing ailment together with their diagnostic points of difference; then to be given the line of treatment often comprising valuable facts which are the results only of a vast experience. Can anything be more practical or better suited for preparing the graduates from such an institution to cope successfully with disease?

Self-reliance is developed by the fact of attendance being non-compulsory, any failures resulting from non-attendance recoiling directly upon ourselves.

Systematic habits can scarcely fail to result from our college routine; for it is the clock and the bell; the entrance of a professor, a short quiz, a scratching of pencils from nine in the morning to five in the evening, then a preparation for the morrow, which cultivates that thoroughness of system which even in the absence of *brilliant* gifts enables the painstaking student to stand alone when he has passed from under the fostering care of his alma mater.

Classmates:—To-night we realize that the past three years have been only a period of preparation; that the diploma which we have received is not a certificate of a completed task, but rather our charter-right to *begin* the work for which we have so long been preparing.

Now that we are assembled for the last time and about entering a profession honored for its nobleness, let us look hopefully toward the future, and henceforth let our only emulation be the rivalry of success.

ADDRESS TO THE GRADUATES.

Rev. L. T. Chamberlain, D.D., delivered the address to the graduates. He at once ingratiated himself into the favor of his audience by telling a number of amusing anecdotes apropos of the medical profession. He quoted some one as saying, "When I am well I am a homœopath and a free thinker, but when I am sick I send for an allopath and a clergyman." He said there was kinship between the code of medical ethics and the prayer book, and related the story of an old lady who had prayed to be saved from "false doctoring." What with the mind cure and the faith cure and Christian science, false doctors and false doctrines seemed to run into and telescope each other. A doctor may speak but one language, yet understand many tongues. He congratulated the graduates upon their entrance into a great profession, and said that their profession and his ran on parallel lines. If they were not well equipped for their work it was their own fault. They had had access to one of the best equipped laboratories, founded by Dr. Hoagland, in the world—to be still more liberally equipped by the generous gift of \$10,000 by Daniel Ayres. They were, he said, knights errant, going forth to do battle against sorrow and disease in behalf of

suffering humanity. He urged them to work for the acquirement of a still higher standard of excellence, a broader and more generous culture, as a requisite for entrance to the study of medicine. He believed the day was coming when the study of medicine would be preceded by a full academic course. We need endowed medical colleges wherein the professors are not dependent for salary upon students' fees. Let the wealth of the rich, the enthusiasm of the philanthropic, and the wisdom of the learned be bent to attain this end. The physician was strongly related to society at large. His work was not completed when he had abated a fever or set a broken limb. If there was a man on the face of the earth who should hold himself to utmost good it was the physician.

The necessity for a lofty personal character for the physician was also urged by the speaker. The doctor was the custodian of the secrets of the home and the hearthstone and stood in the most sacred and confidential of all relations to those to whom he ministered. The man of low moral tone, therefore, was utterly unfitted for the high office and unworthy to be a member of the profession.

AWARD OF PRIZES.

The late Dr. Wm. H. Dudley, one of the founders of the Long Island College Hospital, and for many years president of its Collegiate Department, left in his will a provision by which a gold medal is annually awarded to that member of the graduating class who presents the best clinical report of a case in the medical wards of the hospital. The medal for 1889 was awarded to W. L. Rickard, M.D.

Mr. Henry W. Maxwell, a member of the Board of Regents, gives a gold medal annually to the member of the graduating class who writes the best clinical report of a case in the surgical wards of the hospital. This medal is given in remembrance of the late Dr. William H. Dudley, and is known as the "Dudley Memorial Medal." The medal for 1889 was awarded to James L. Cornell, M.D.

Prof. E. A. Lewis awarded a prize for the best anatomical preparation to Mr. Richard Slee, of the Junior Class.

The resident staff for the ensuing year was announced as follows : Drs. Charles A. Briggs, William E. Jenner, George W. Neidecker and Wilbur L. Rickard. At the close of the exercises the benediction was pronounced and the large audience dispersed.

PROGRESS IN MEDICINE.

SURGERY.

BY GEO. R. FOWLER, M.D.,

Surgeon to St. Mary's Hospital and to the Methodist Episcopal Hospital.

THE SURGICAL TREATMENT OF BRAIN DISEASES.

E. von Bergmann.—Archiv. fur Klinische Chirurg., Bd. xxxvii, p. 759-872.

The author restricts, rather than enlarges, the field of "brain surgery." He opposes any operation which does not lead, in a natural manner, to the result arrived at. Inquiry is made into the conditions under which the surgical procedure offers chances of success, and operative interference is recommended only in this class of cases.

Brain abscesses, deeply situated, come more and more within the scope of justifiable operative interference, as difficulties of diagnosis are overcome. Metastatic abscesses, however, which occur but seldom singly, are scarcely fit cases for operation. The difficulties of thoroughly removing all of the infected tissues, or of disinfecting the adjoining parts, likewise places tuberculous abscess of the brain beyond the domain of the operating surgeon. The most favorable cases for operation are those of abscess of traumatic origin, or arising from supuration within the middle ear or other bone disease.

Attention is called to differences existing between acute abscess of the cortex arising from direct infection following an injury to the cranium, and which are situated closely under the point of fracture—where location is pretty accurately defined by the occurrence of paralysis limited to certain parts, and which make their appearance at the end of the first or during the second week following the injury, and accumulations of pus occurring and noticeable only after weeks, or even years. The latter, unlike the former, lie at some distance below the cortex beneath a layer of apparently unchanged brain substance.

An important fact to be borne in mind in the diagnosis of this latter class of abscess is that they have not been observed, as have the other variety, following a simple subcutaneous traumatism. From this, v. B. advances the hope that, as the proper treatment of linear, punctured or depressed fractures becomes better understood, their occurrence will be a matter of great infrequency.

Abscesses following middle ear disease are never observed as acute suppurative processes. The diagnosis will rest somewhat upon the chronicity of the condition. Difficulties, however, will arise from the imperceptible beginning, insidious course and relatively long latency of the disease. v. B. believes that trauma is never the accidental cause of this variety of abscess, although any injury may rouse it from a latent condition and lead to increased suppuration and rupture into the inferior horn of the lateral ventricle. An abscess, the result of a chronic purulent otitis media, is generally deeply situated; most frequently, perhaps, in the temporal region, when the petrous portion of the temporal bone is the part affected, and less frequently in a hemisphere of the cerebellum. The latter follows essentially disease of the mastoid cells.

Suppuration in other portions of the cranium is by far less important than the foregoing in the history of brain abscess.

v. B. classifies the symptoms of brain abscess into three groups: 1, those depending upon the suppuration itself; 2, those indicating intra-cranial pressure; 3, those dependent upon disturbances of function, the most important of which follow invasion of the motor regions. He restricts operative interference to those so-called typical cases, in which the diagnosis is relatively well assured.

THE PATHOLOGY AND TREATMENT OF GLEET.

Oberlander.—Vierteljahrschrift für Dermatologie und Syphilis, 1887, No. 477 and 637.

O. publishes an experience extending over several years, based upon observations made with the electric endoscope, similar to that known as the Nitze-Leiter instrument. Of the purely catarrhal form he makes two varieties, namely, urethritis mucosa hypertrophica, and urethritis mucosa catarrhalis; distinguishing these from the inflammatory glandular infiltration form. The latter are divided into circumscribed glandular, proliferating, hypertrophic, and lastly the constricting variety. Further is discriminated the granular falciform, the follicular sicca and follicular constricting varieties. In the treatment a form of dilator is employed somewhat after the model of that of Otis. It is covered, however, with a closely fitting rubber cover, which does not interfere with its introduction, and which seems to prevent the mucous membrane from falling between its blades, and becoming pinched. A dilatation to a point from 25° F. to 36° F. is necessary.

A NEW METHOD OF TREATING FUNGUS DISEASES OF THE SKIN.

Reynolds.—Monatsheft für prakt. Dermatologie, 1887, No. 21, p. 145.

R. recommends, in fungous diseases of the skin (herpes tonsurans, favus, etc.) the use of a sponge wetted with a germicidal solution (cor-

rosive sublimate, 1 per cent.) attached to the positive pole of a battery, while the negative pole is placed somewhere in the neighborhood. By means of the electric current, it is claimed, the deeper layers of the skin are reached. A case of favus and two cases of herpes tonsurans were cured in three weeks by this means.

ECTOPIC TESTICLE.

Ch. Monod and G. Arthand (Archiv. Gener. de Med., 1887, Dec.).

Ectopic testicle is almost always accompanied by a progressive atrophy of the gland. Three stages of this condition are to be discriminated:

1. The spermatic function may still be preserved.
2. With preservation of the function, perivascular sclerosis and induration of the corpus Highmorianum occur, restraining secretions and producing sterility without atrophy.
3. Finally, atrophy of the gland occurs through connective tissue hypertrophy and disappearance of the epithelium.

He sums up as follows:

1. In almost all cases of ectopic testicle the gland atrophies.
2. No disturbance of function occurs in the beginning; later on, gradual impairment of function occurs.
3. Under the influence of external injuries and age, mechanical restraints to secretion and sterility develop.
4. Progressive sclerosis impart to the ectopic testicle the conditions of senility.

A NEW ANTISEPTIC POWDER DRESSING.

J. Habart (Wiener med. Presse, No. 9, 1888).

The author proposes to employ infusorial earth, sterilized by being subjected to a heat sufficient to cause it to glow. It may be used pure or treated by the use of disinfectants. Infusorial earth is an easily friable grayish or whitish mass, occurring at times as a solid, chalk-like deposit and sometimes as a meal-like substance. It will absorb from five to seven times its own weight of water. Mixtures of equal parts of this infusorial earth and salicylic acid, salol, and iodoform, as well as a 1-2000 trituration of corrosive sublimate, proved useful. The easy solubility of the latter in the wound secretions renders the application especially useful in infected wounds. The value of this preparation of infusorial earth as a provisional occlusive dressing in gun-shot wounds, during transportation from the battle-field to the field hospital, is especially commented upon.

UPON THE ANTISEPTIC INFLUENCE OF CHLOROFORM.

E. Salkowski (Deutsche med. Wochenschrift, 1888, No. 16).

Basing his observations upon the fact that a slight addition of chloroform will prevent ammoniacal fermentation in urine, S. experimented with the view of determining its influence upon the fermentative processes. Certain fermentations of an organic nature were prevented, while changes the result of inorganic fermentation were not influenced. Experiments with milk, cane and grape sugar, and serum, proved that after the addition of chloroform, in spite of the presence of yeast, absolutely no fermentation took place for months; the casein and fat globules of the milk were precipitated as a white sediment. Serum, meat infusions, and chopped meat were protected from decomposition, but breaking up and oxidation of fat was not prevented. Equal parts of chloroform and water destroyed the bacillus of anthrax, after twenty-four hours' exposure, but it had no influence upon the spores. Its greatest anti-bacterial efficiency is developed in experiments with the cholera bacillus, which was completely annihilated after an exposure of but one minute.

But a restricted use will be found for chloroform as an antiseptic in surgical practice, partly because of its rapidly volatile character and partly because of its want of influence over those organisms which are propagated through spores. Some of the chlor-ethyl compounds seem also to possess antiseptic qualities, without however reaching the same degree of antiseptic power as chloroform.

UPON DEGENERATIVE INFLUENCES OF ANTISEPTICS UPON THE PARENCHY-
MATOUS ORGANS, WITH PARTICULAR REFERENCE TO THE
SURGERY OF THE KIDNEYS.

Senger (Berliner klinisch. Wochenschrift, 1888, No. 22).

In view of some experiences with fatal cases, occurring shortly after operations upon the kidneys, S. made some experiments upon animals to determine the influence of sublimate, carbolic acid, iodoform, boric acid, salicylic acid, and common salt upon the kidneys. After lethal doses, the kidneys upon removal showed in the fresh preparation an exudation mixed with blood corpuscles, between the glomeruli and capsule, a destruction of and partial sweeping of the cells from the canaliculi. Chloride of sodium seemed to exert the least unfavorable influence, and S. recommends that sterilized water, with five per cent. of common salt, be employed in abdominal and chest operations, where large absorbent surfaces are exposed.

CONTRIBUTIONS TO THE TREATMENT OF FRACTURES INVOLVING OR IN THE
NEIGHBORHOOD OF THE JOINTS.

Oberet, of Halle (Sammlung klin. Vorträge, No. 311).

The treatment of fractures involving or occurring in the neighborhood of joints has only recently received attention to the extent of attempting the prevention of ankylosis. Massage, recently used in fractures of the patella, has been extended, by Lucas-Championiere and Gerst to the treatment of other fractures; but immobilization of the fragments was not practiced during the massage, and hence displacement of the fractures occurred. O. points out the causes of ankylosis, and recommends, in order to avoid the latter: 1st. Puncture, in case of recent and extensive hæmarthrosis, followed by methodical compression and massage. 2d. Properly applied methods of preventing displacement of the fragments. 3d. Passive movements of the joints during the period of repair. In the typical fracture of the lower end of the humerus, involving the elbow-joint, movements of the fingers are regularly carried on from the first, and the splints removed after three or four days, and massage of the hand and forearm practiced, after which a plaster-of-Paris dressing is applied. At the end of seven days the parts are again massaged, and passive movements practiced. This is continued until about the eighteenth day, when usually the fracture is united and the function of the joint restored. Martin's elastic bandage is found useful to reduce the swelling when the latter persists. In cases in which large extravasation occurs in the beginning, and a retention apparatus is necessary, a plaster-of-Paris splint is applied, and at each time of removal of the same, for the purpose of massage and passive motion, when reapplied the forearm is placed in a changed position, so that it shall form a new angle of flexion or extension at each application of the plaster-of-Paris dressing. In all cases, splints and bandages are abandoned at the end of three weeks, but massage and frequent exercise persisted in.

UPON CAPILLARY DRAINAGE AND ANTISEPTIC TAMPON OF THE PERITONÆUM
BY MEANS OF IODOFORM GAUZE.

S. Pozzi (Ann. de Gynecol., 1888, T. xxiv., p. 255).

Peritoneal drainage is indicated, according to P., 1st, where hæmorrhage is feared after closing the abdominal wound; 2d, in doubtful antiseptic conditions of the peritoneal cavity; 3d, in cases of considerable peritoneal deficiency incident to removal of large tumors with extensive adhesions. The first indication is of rare occurrence. The second may occur in cases in which circumscribed peritonitis existed prior to the operation; in cases in which cauterization and extensive

charring of the remains of the tumor are prominent features of the technique, as well as in cases where perforation of one of the hollow organs of the peritoneal cavity occurs. The third indication refers to Mikulicz's so-called dead spaces of the abdominal cavity. It is claimed that the only really efficient drainage of the abdominal cavity is that by means of iodoform gauze. To Hegar belongs the credit of having introduced this into practice. Iodoform wicking, recommended by Kehrer Breisky, Gersung, and Chrobak, are but modifications of Hegar's proposal. P. uses only capillary drainage following vaginal hysterectomy. He extends its use, however, in connection with anti-septic tampon of the peritoneal cavity, in suitable cases, in the technique of which he follows Mikulicz.

ON RESECTION OF THE PHARYNX AND ŒSOPHAGUS.

(Nord. med. Archiv., 1887, Bd. xix., Copenhagen.)

The following operation is recommended: Preliminary tracheotomy is performed. Sub-hyoid pharyngotomy, through which the extent of the neoplasm is more easily examined. When the entire circumference of the pharynx is invaded the larynx must be removed also. From the middle of the subhyoid pharyngotomy wound a vertical incision is made in the median line to within one and one-half centimetres of the trachæotomy wound, in such a manner as to leave a bridge of tissue above the latter. Particular stress is laid upon the preservation of this bridge, in order to prevent subsequent cicatricial contraction of the two openings. With a blunt elevator the larynx is now loosened from the pretracheal muscles; when this is freed, a cross incision is made behind the larynx clear back to the connective tissue lying in front of the vertebral column. Some venous hæmorrhage may now occur, which however is easily controlled by pressure. With the handle of the scalpel and the fingers the infiltrated pharynx, in connection with the larynx, is removed *in toto* from the vertebral column and muscles of the neck. The trachea is now cut through, and the opening packed with gauze to prevent the entrance of blood during the further steps of the operation. The œsophagus is cut through last, and before completing the section the peripheral end is secured by a few sutures. The cavity thus left is now carefully gone over, and if any remaining portions of the growth appear, or infiltrated glands, the same may be removed. Partial or complete excision of the thyroid body may be necessary, in addition.

The wound is not sutured, but is packed loosely with iodoform gauze. Nourishment is carried on through a nasal tube, which may be allowed to remain for from ten to fourteen days. Later, the patient is fed several times daily by the œsophageal stomach tube. The wound cavity is generally fully cicatrized in from eight to ten weeks.

CRANIO-CEREBRAL SURGERY. THE TREPHINE IN RECENT INJURIES OF THE SKULL.

A. Broca and P. Sibileau.—Gaz. des hopitaux, No. 75, 1888.

The work of the French anatomists and surgeons offers peculiar interest, for the reason that the first authority of Germany, von Bergmann, has recently treated upon the same subject at considerable length.

While the German author arrives at a conclusion which tends toward lessening the field of operative surgery of the brain, the French authors endeavor to prove that, by the progress made during the past years in the anatomy and physiology of the brain, a larger field than heretofore is opened to the surgeon; one which will grow still larger in the near future. While von Bergmann warns particularly against operations that do not indicate plainly the manner of reaching the end aimed at, and critically examines the conditions under which success is to be attained, Broca and Sibileau, on the other hand, lay especial stress upon the employment of antiseptic dressings, and content themselves with a consideration of that which decides the prognosis following the operation.

The anatomical portion of the work, probably from Broca's pen, is masterfully written, and is to be recommended to every one interested in this field of work. Upon the paragraphs concerning the localization of brain affections, some points can be profitably referred to. It is surprising to find how many centres, particularly of motion, are well noted. The authors point to Broca's centre of speech in the third left frontal convolution; to the motor area of Fritsch and Hitzig, Ferrier and others, which furnishes localization for the face, upper and lower extremities, the muscles of the tongue and the muscles of the eye. For aphasia four distinct points are stated, corresponding to word blindness, word deafness, aphemia and agraphia. For the practical surgeon, up to this time, these details have no especial value; to him it suffices to know, that in the brain there is a motor area, irritation of which causes certain definite movements, and injury to which abolishes the same.

The epileptic zone of Albertoni, according to the authors, does not exist. The Jacksonian epilepsy arises from disturbances of the cortical substance, which may be referred to widely different points in the motor area.

Especial directions are laid down for defining the place on the bony skull where trephining must be done in order to locate certain centres. Such points exist for the speech centre, for Rolando's fissure, the fissure of Silvius, and the external and internal occipital fissures. Trephining for group symptoms is called "primary," and opposed to this "prophylactic" trephining. As an example of the latter is to be instanced

trephining for depression, fissure and fracture. Without doubt the operation is indicated in all cases of compound fractures, while the question is an open one of its necessity in cases of subcutaneous injury. Here the nature and intensity of the grouped symptoms will decide the surgeon.

UPON HIGH OR SUPRA-PUBIC CYSTOTOMY BY CROSS-SECTION.

K. Eigenbrodt.—*Deutsche Zeitschrift für Chirurgie*, Bd. 28, pp. 61–168.

Trendelenburg, of Bonn, an earnest and persistent advocate of the supra-pubic method of cystotomy, has improved the technique of the operation, by substituting for the vertical median incision, a cross incision through the abdominal walls. The skin incision is followed by loosening of the muscles and layers of fascia as closely as possible to their attachments to the brim of the pelvis. He does not regard as important previous filling of the bladder and rectum. After baring the upper brim of the pelvis and clearing of the prevesical cellular tissue, the fold of peritonæum is to be lifted away, if possible without the help of the knife. The second and third fingers of the left hand are to be pushed into the prevesical space, in such a manner that the dorsal aspect of the former is directed to the brim and the palmar side turned to the bladder and peritoneal fold. The index and middle fingers are now pushed as far as possible behind the symphysis, in a downward direction, till the region of the base of the bladder is reached. Then the soft parts lying in front of the bladder are cautiously crowded in an upward direction, by means of the curved, hook-like fingers. The presenting bladder, without any further fixation of its walls, is incised. If it be empty, as for instance, before opening the bladder, its wall is grasped between two forceps, having previously elevated the pelvis after the manner of Trendelenburg, to facilitate this portion of the operation. After-treatment is carried on as in previous methods; no bladder sutures; sutures may be placed in the wound for the purpose of lessening its gaping when necessary; drainage by means of a T shaped tube for from one to two weeks, placing the patient in the lateral position, changing from left to right. In the earlier cases the abdominal decubitis was tried and found to be unnecessary and was abandoned.

Examination of the interior of the opened bladder, as in previous methods, was found to be facilitated, but as in former procedures, could not be said to be sufficiently accurate; as, in case of changes in the bladder wall difficult to be determined (tumor, tuberculosis), Trendelenburg constructed and used an electric bladder-speculum for this class of cases. This latter resembles in principle the vaginal speculum of Simon, fastened to the handle of which is an extra piece, and upon the end of which is attached an incandescent electric light, resting upon the concavity of one of the blades.

In lithotomy cases, according to Trendelenburg, the operation is superior to other methods, particularly in very large concretions, as well as in impaction of stone in diverticula. As such complications cannot always be known beforehand, preference is to be given to this incision in all cases. Trendelenburg objects to the digital exploration through the perinæum, of Thompson, and advises, in case of suspicion of bladder tumor or a condition of irritable bladder, difficult of diagnosis, but which may owe its origin to tumor or tuberculosis, that the supra-pubic cystotomy by the cross-incision be at once resorted to.

EXTIRPATION OF THE LARYNX FOR CANCER.

Demons.—Congrès Français Chirurgie, Paris, March 12–17, 1888.

Demons has performed extirpation of the larynx for cancer twice ; upon the first occasion in a very extensive growth, including the epiglottis and the tongue ; the second because of an epithelioma attacking the larynx. Healing followed in both cases without accident, although there occurred in the first case a recurrence of the growth at the base of the tongue. The second patient, at the end of ten months, was found to be free from the disease. He rejects the operation where neighboring parts, as for instance, the glands are affected, or where the growth invades the neighboring parts.

Dupont and Molliere each report upon a case. The former prevents the influx of blood into the deep air passages, by cutting through the trachea at an early stage of the operation, and by suturing the same at once into the inferior angle of the wound ; the latter aims to reach the same result by Trendelenburg's canula. The latter he allowed to remain during the first ten days of the after treatment, with good results.

UPON PRIMARY LARYNGEAL ERYSIPELAS.

A. Bergman.—St. Petersburg Med. Wochenschrift, 1887, No. 49 and 50.

Hitherto only secondary erysipelas of the larynx has been recognized. The first case was reported by Paster, in which case direct infection resulted in the disease. Paster was finally compelled to perform tracheotomy for the patient's relief from the impending suffocation resulting from the laryngeal stenosis. The wound was attacked by the erysipelas and the patient finally perished. Post-mortem examination showed extension of the erysipelatous process into the bronchi, and œdema of the lungs.

Massei separated the disease in question from the group of laryngeal affections characterized by the occurrence of œdema, although he was unable to demonstrate the presence of cocci. Fatano and Bionidi, however, succeeded in this respect.

The disease in question may be comprehended under the following: In those previously in good health, or after some days of catarrhal affection of the larynx, accompanied with high fever (40° C.), dysphagia, hoarseness, pains referred to the pre-laryngeal region, and well-marked swelling of the peri-tracheal glands. Inspection of the pharyngeal parts gives no evidence of change other than swelling and intense redness of the laryngeal mucous membrane, particularly the ary-epiglottidean folds; the region of the arytenoids and the base of the tongue are likewise invaded. Upon the swollen mucous membrane may be found stagnant mucus and a whitish coating. Either the erysipelatous process recedes or the respiratory disturbances may lead to a fatal issue through extension of the process to the lungs. The remissions in this course of the disease are to be particularly noticed, the improvement not restricting itself entirely to the subjective symptoms, but constitute an apparent disappearance of the disease, which latter then suddenly recurs with renewed vigor.

Bergman reports two cases, brothers, one probably infected by the other, both of whom recovered. The second case developed while the first was in convalescence, and the rapid supervention of urgent symptoms of laryngeal stenosis demanded tracheotomy. The next day the disease had disappeared from the larynx, but both arms were attacked. This, however, soon disappeared.

The rapid occurrence of laryngeal stenosis in these cases is pointed out, together with the necessity for prompt tracheotomy when indicated.

UPON ARTHRECTOMY OF THE FIRST METATARSO-PHALANGEAL JOINT.

F. Petersen, Kiel (Archiv f. Klinische Chirurgie, Bd. 37, Heft 3).

Formerly it was the custom, in tuberculous diseases of the joint, to open the joint, and remove the bone, which may or may not be diseased, while the indubitably diseased capsule was left *in situ*. Removal of the synovia then followed the resection of the bone. At the present time an endeavor is made to remove every diseased portion and preserve the healthy structure. Petersen replaces the usual longitudinal incision upon the inner side of the joint by one through the web between the first and second toe to the level of the neck of the metatarsal bone. The incision lies somewhat nearer to the larger toe. Then the toes are pulled strongly apart, and the first metatarso-phalangeal joint is opened. He then pushes aside the soft parts from both bones towards the plantar and dorsal surfaces, without cutting through the insertions of muscle or tendon. The further retraction of the soft parts is accomplished by abduction of the toe. Finally, the toe can be completely turned inwards and dislocated, so that it lies along the

inner side of the foot, with its point looking backwards and its joint surfaces lying completely exposed. The diseased parts can now be readily removed, after which the member is replaced.

THE FASTENING OF WOUND TAMPONS BY MEANS OF SKIN-FOLDING SUTURES.

Prof. Madelung (Centralblatt f. Chirurgie, No. 46, 1888).

Wound tampons of antiseptic material, and that principally of iodoform gauze, have found application during the last year, with increasing frequency. In many cases certain and immovable fastening of the tampons is absolutely necessary. Frequently this is not difficult, as, for instance, if the wound cavity approaches a bottle shape or possesses bony walls. Sometimes the tampons are secured with great difficulty. Tamponing, for instance, in operations performed in two stages—opening of cysts situated within the peritonæum (echinococci, cysts of the pancreas), or the hollow organs of the abdominal cavity (stomach, bowel, gall bladder)—in these, the wound of the abdominal walls made in the first sitting, it not rarely occurs that during an act of vomiting or coughing while the dressing is being changed the tampon is forced out of the wound when the usual methods are employed. As a result, the opening becomes diminished, and the cystic wall portion is pushed away.

Madelung secures the tampons by drawing both sides of the wound upwards, turning in a fold of skin so that these folds can be sutured together with their integumentary surfaces facing each other. Complicated dressings are thus done away with.

Having demonstrated the applicability of this procedure, Madelung used the skin-folding dressing in various contingencies. Iodoform tampon dressings, after operations upon the scrotum following herniotomy, were similarly secured. It is also useful in dressing wounds about the anus and genital organs.

MISCELLANEOUS.

A CONTRIBUTION TO THE ETIOLOGY OF SCARLATINA-DIPHThERIA.

BY PAUL H. KRETZSCHMAR, M.D., BROOKLYN, N. Y.

Translated from *Medicinische Monatschrift*, New York, February, 1889.

Although the relation of cause and effect between faulty drainage and bad hygienic conditions in general on the one side and scarlatina and diphtheria on the other, is well settled and recognized, we seldom meet with an illustration as instructive and positive as the following :

Mr. M—— and his family, who have been known to me and been my patients for about ten years, removed about two years ago from Vanderbilt Avenue near Pacific Street, to a newly built residence on the corner of Hopkinson Avenue and Fulton Street, one of the most elevated points of Brooklyn, and a portion of the city which is rapidly becoming populated.

The three-story corner house having three windows toward Fulton Street and six on Hopkinson Avenue, bathrooms, water closet, etc., standing almost alone, upon very high ground, compares apparently most favorably with the former residence in Vanderbilt Avenue, which is, as are many houses in that neighborhood, a small two-story frame house, of rather ancient origin, badly in need of repairs, both in and outside.

December 21st, 1888, for the first time during the last two years I was called upon to visit my old patients again. The eldest child, a girl, with blonde hair and a fair complexion, now about ten years of age, I remembered well, and I was much surprised when I learned on my arrival that she had died with scarlatina, and had been buried that day. At the same time I was informed that Mrs. M—— and a child, a girl of four years of age, were also sick, and that Dr. X—— was in attendance. The examination revealed that Mrs. M—— was suffering from scarlatina and the child from diphtheria and scarlatina. Excessive depression of the heart's action was the most pronounced symptom, and in my opinion the most serious complication in both cases, and it, together with the general aspect of these cases, induced me to make an unfavorable prognosis for the child and a doubtful one for Mrs.

M——, who, by the way, had been confined only three weeks previous. Two boys and a female infant were in the house with the patients, but as yet free from the disease.

Alcoholic stimulants, especially champagne, of which Mrs. M—— took four pints during twelve hours, spray of the pharynx with solution of bichloride of mercury (1-2000). tr. ferri mur, with quinine and tr. nucis vomicæ for Mrs. M—— and tr. ferri mur. without addition, but supplemented by the free application of Squibb's oleate of quinine for the girl were prescribed; a trained and reliable nurse was procured, and good care was taken to open three of the windows, all of which had been scrupulously kept closed to prevent the patients from "taking cold."

The following day the condition of the child was decidedly worse, temperature between 103 and 104½, with a small thready pulse varying from 140 to 160 per minute. Mrs. M——, as before; temperature 102 to 102½, pulse weak, 128 to 136 per minute, small quantity of albumen in the urine. Upon the evening call of December 22d, I found another child, a boy of about six years of age, stricken with diphtheria. During the night from December 22d to 23d the girl died. The 23d and 24th day of December did not show any new developments, except that during those days the same dangerous depression of the heart's action which led to the death of the girl showed itself in the boy. On the evening of December 24th, Mrs. M—— showed marked signs of improvement, but the boy presented a distressing picture, lying in his crib, with his eyes half closed, neither awake nor asleep, the face having a bluish, gray, yellow hue; the pulse at the wrist almost imperceptible, with about 150 beats per minute and unable to speak above a whisper. Walton's oxygen was added to fresh air and administered in liberal doses—a five-gallon bag being filled from the cylinder, and being placed upon the patient's bed, its contents were allowed to escape before his mouth in doses of about two gallons every hour and a half. Champagne was used in most liberal doses, and one grain doses of calomel were put upon the tongue hourly and washed down with wine.

The following morning, Dec. 25th, all the symptoms had lost some of their severity, except the aphonia. Mrs. M—— continued to improve.

During the night from December 24th to December 25th, the fifth member of the family, the eldest boy, about seven years of age, had been restless, had vomited several times, and on the morning of the 25th he showed the early symptoms of scarlatina, inflamed pharynx, raspberry tongue, elevation of temperature, etc. The scarlatina eruption had appeared in the evening, and the patient was placed under

appropriate treatment. Nothing of special importance developed after December 25th; Mrs. M—— continued to improve, and left her bed on December 30; the eldest boy never showed any serious symptoms, and passed safely through a rather mild attack of scarlatina; the younger boy, however, remained in a precarious condition for a number of days and was still unable to speak above a whisper on January 3d, 1889. The youngest child, three weeks old, escaped both scarlatina and diphtheria.

The most interesting points connected with these cases are :

1. That five members out of seven of one family are taken sick with either diphtheria or scarlatina, one of them developing both.
2. That the infant child escaped the infection entirely.
3. That the one infected last, after proper ventilation had been established, developed scarlatina in a mild form, while the others suffered from the most severe constitutional symptoms.
4. That there are physicians among us who object to the entrance of pure and fresh air, for fear that the patients might "take cold," forgetting that by their action they keep the deadly poison within the walls of the patient's room.
5. That alcoholic stimulants, especially champagne, have again proven their great power as heart sustainers.
6. That oxygen in the one case where it was employed, carried the boy through the most dangerous period—against my own expectations.

To find the source of infection seemed to me to be of the greatest importance, and an investigation made after my first professional call, revealed the following condition of affairs: The house had been built about two years before, and at that time it had been the intention of Mr. M—— to connect the building with the large sewer which runs through Hull Street, a distance of about 250 feet from the corner of Hopkinson Avenue and Fulton Street.

Upon inquiry at the Department of Public Works, Mr. M—— was told that such an undertaking was both expensive and unnecessary, especially because the city would build a sewer through Hopkinson Avenue within a few months, which would of course pass directly in front of the house. Our diligent and economical grocer was well pleased with the prospect, and after putting bathrooms, water-closets, etc., in the new house, he had all the necessary waste pipes arranged in such a way that they could easily be connected with the sewer on Hopkinson Avenue, as soon as one was built. Since that time two years have passed, but Hopkinson Avenue is still without a sewer, and during all this time the contents of the waste pipes have been deposited in front of Mr. M——'s house, until lately the entire ground has

become saturated with waste products and the walls of the cellars give the plainest evidence of such a condition both by means of sight and of smell.

The question naturally arises, who is responsible for a state of affairs which caused so much suffering in one family and the death of two previously strong and healthy children? Is it the Department of Public Works, which gave Mr. M—— advice not to build a connection with the sewer in Hull Street, but rather to allow the waste products to accumulate in the ground directly around the premises? Or is it the Department of Health, which, knowing the consequences of such unhygienic and unsanitary mode of building, gave permission to carry out the suggestions of the Department of Public Works? Or is it the head of the house, who suffered his family to live in a place surrounded by deadly infection? Or is it the attending physician who failed to do his first duty when he neglected to make use of all possible means to introduce fresh air into the rooms impregnated with the scarlatina and diphtheria poison?

SOME RELATIONS OF SCIENTIFIC EXPERTS TO THE ADMINISTRATION OF THE LAW.

A Paper Read before the Society of Medical Jurisprudence, by Willard Bartlett,
Justice of the Supreme Court.

Mr. President and Gentlemen :

Your invitation to read a paper before this society came to me at so busy a period in the judicial year that I should have been obliged to decline it unless I had selected a subject for discussion closely connected with my daily work. Every judge of a court of general jurisdiction in a great city, constantly occupied as he must be in trying and hearing litigated causes, forms opinions, more or less positive, respecting the relations of scientific experts to the administration of the law. He enjoys exceptional opportunities for studying these relations in their varied aspects; and it occurred to me that I could not do better on this occasion, addressing an association made up for the most part of physicians and lawyers, than to present for your consideration a few suggestions based upon personal observation as to the manner in which scientific experts can best assist the courts to administer justice.

It is of the medical man that I shall speak, chiefly, if not wholly; for the medical man is the scientific expert with whom our State courts

are most familiar. He appears oftenest, perhaps, in negligence cases—that is to say, in suits brought to recover damages on account of physical injuries suffered by the plaintiff in consequence of some negligent act on the part of the defendant. Many such cases arise out of accidents on railroads. Upon the trial, except in the comparatively rare instances in which there is no dispute as to the nature, extent and consequences of the plaintiff's injuries, the respective parties are assisted by physicians or surgeons, or both, who testify in reference to these matters, and often also advise counsel as to the conduct of the medical or surgical part of the case.

The wise doctor, as it seems to me, will take care not to act in both capacities. If he is to testify in the case, he will not act as assistant counsel; if he acts as assistant counsel, he will keep off the witness stand. There is no good reason why the most distinguished physician should not place his professional knowledge and experience at the service of one of the parties to a litigation which involves questions of medical science. To do so cannot justly subject him to reproach; but it does lessen his fitness and his usefulness as a witness in that litigation. In assisting counsel, he will inevitably come to share the sentiments of counsel as to the result. Just as counsel will seek to bring out every fact that may prove beneficial to the cause of his client, and will endeavor to destroy, as far as may be, the effect of any proof which is injurious to him, so the medical man thus employed will suggest questions for the examination of witnesses on the other side, which will call out answers favorable to the party at whose instance he has been brought into the case. All this goes on before the jury, who fully comprehend where the medical questions really come from. If, afterward, they see the doctor take the witness stand, it is impossible that they should regard him as otherwise than prejudiced. However truthful his testimony may be, and however correct his opinions, his evidence is the evidence of a partisan, and this fact invariably detracts from its force and effect.

When, therefore, a litigant or his lawyer applies to a physician or surgeon for assistance as an expert, the medical man should first ascertain whether it is desired that he shall be a witness in the case or shall act as adviser to counsel.

If he be asked to appear as a witness, he should carefully abstain from seeing the injured person, or examining into the circumstances, upon any agreement or understanding that his right to compensation for so doing is to depend upon the conclusion he reaches. I have reason to believe that cases are not unknown, in which the counsel for the plaintiff has said to a physician: "I think my client's injuries are serious and that he will never be a well man again. Go and see him for

me. If you find that he is not permanently hurt, I shall not expect you to charge me anything for making the examination ; but if you conclude that his injuries are incurable, I will call you as a witness on the trial, and pay you handsomely." A proposition of this kind will not be accepted by the really professional man of high character. He will insist that his compensation shall be in no wise dependent upon the opinion which he forms. If this is his invariable practice he will always be prepared to sustain the severest cross examination, and if the fact is brought out in the course of the cross-examination that the party by whom he is called paid him or agreed to pay him for examining the injured person, no matter what view he might take, this bit of evidence will add greatly to the weight of his other testimony with the jury

The attitude of the medical man who is called upon to testify as an expert should be, as nearly as possible, one of absolute impartiality as between the litigants. He should be actuated solely by a desire to be true in his statements of fact and sound in his expressions of opinion. Many expert witnesses, particularly young men, are placed at a disadvantage by cross-examining counsel, because of their apprehension that they may prejudice the case of the party who has called them, if they give the answers which particular questions obviously require. Such fears lead to evasions or objectionable responses, by reason of which causes are sometimes needlessly lost. The really qualified medical expert, who understands what he is testifying about and does not testify about what he does not understand, has nothing to fear from any cross-examiner, provided the doctor is willing to answer the lawyer fairly and candidly.

Thus far, I have spoken of physicians who are not regularly employed in behalf of the parties in whose favor they testify. Many railroad companies, however, employ medical men continuously under salary, to investigate all cases of personal injury which occur upon their lines, and to assist in the trial of the lawsuit to which such casualties give rise. The testimony of these witnesses is much less weighty and effective with a jury than the evidence of physicians called in for the particular case only ; and I have more than once heard counsel ask : " How long would the doctor continue to be employed by the railroad company unless he always testified in its favor ? " Physicians thus permanently employed to treat accident cases are also peculiarly exposed to damaging cross-examination. I recollect a case in which the plaintiff sued to recover for the loss of the forefinger of her right hand, which had been taken off by a heavy iron machine, at which she was at work in the defendant's factory, and which was alleged to have been out of order at the time. A young doctor was called in behalf of the defense, and was disposed to make light of the injury. He said the

girl came to him immediately after she was hurt : that her finger was then hanging to her hand by a shred of skin ; but that the wound was by no means a bad one, being a perfectly clean cut, and he added that it was not nearly so bad a case as others he had seen from the defendant's factory. "How many such cases have you seen within the last year or two among young girls there?" asked counsel for the plaintiff. "Fifteen or twenty," answered the witness ; and his response, I think, determined the case, which was very evenly balanced on the rest of the evidence. It suggested to the jury that there must be negligence somewhere in an establishment that produced so many maimed girls, and they promptly gave the plaintiff a verdict.

But I have no disposition to criticise railroad companies or other corporations upon whose property accidents are liable to occur, for employing physicians to protect them against false or exaggerated claims on account of personal injuries. Indeed, they are instrumental in procuring adjustment of well founded claims, and, no doubt, hundreds of suits are settled every year upon the recommendation of the medical advisers of railway corporations. Instances sometimes occur however, of gross invasions of private right by physicians so employed, who have been known to force their way into the homes and to the very bedsides of injured persons without regard to the protests of their families, in order to ascertain the extent of the injuries immediately after they were inflicted, and to prepare themselves to testify on the subject if a suit should subsequently be brought. These trespasses are committed only against people in the humbler walks of life, who hardly know that they can rightfully expel the intruder under such circumstances. They are wholly without justification or excuse, and it is satisfactory to find that juries pay little attention to medical testimony founded upon these unwelcome visits.

In his well known *History of the Criminal Law of England*, Sir James Fitz James Stephen, one of the most distinguished judges of the High Court of Justice at the present time, suggests a course of conduct on the part of the medical witnesses in accident cases which he thinks would do away with the reproach which attaches to expert testimony because the witnesses are so often merely counsel in disguise. "If medical men," he says, "laid down for themselves a positive rule that they would not give evidence unless before doing so they met in consultation the medical men to be called on the other side and exchanged their views fully, so that the medical witnesses on the one side might know what was to be said by the medical witnesses on the other, they would be able to give a full and impartial account of the case which would not provoke cross examination." He truly observes that such a practice implies a high standard of honor and professional knowledge

on the part of the witnesses called to give evidence ; and the suggestion would seem almost Utopian, were it not that the writer adds : "For many years this course has been invariably pursued by all the most eminent physicians and surgeons in Leeds, and the result is that in trials at Leeds (where actions for injuries in railway accidents and the like are very common) the medical witnesses are hardly ever cross-examined at all, and it is by no means uncommon for them to be called on one side only." This is the best possible answer to the objection that the plan assumes a higher standard of conduct than is practicable. Experience has shown that it does not ; and what English medical men can bring about in the borough of Leeds, American medical men ought surely to be able to accomplish in the city of New York.

The provisions of our laws relating to the confinement of the insane require the certificate of two physicians as the basis of a commitment to an asylum in the first instance ; and in New York and Brooklyn it is probable that medical men make their appearance in court as examiners in lunacy more frequently than in any other capacity, except as witnesses in negligence suits. The functions which they exercise in this respect are important and involve grave responsibility ; and it has been suggested that some special knowledge with reference to insanity ought to be required on the part of a physician, before authorizing him to make a certificate upon which a citizen can be deprived of his liberty. Under the existing statutes no person can be committed to or confined in any public or private asylum or institution for the treatment of the insane, except upon the sworn certificate of two physicians, setting forth the insanity of such person ; and no person can be held in confinement in such asylum or institution for more than five days, unless within that time the certificate of the physicians shall be approved by a judge of a court of record of the county or district in which the alleged lunatic resides. A large number of these certificates come before the judges for approval in the course of the year. The physicians by whom they are signed are not required to have any special training or experience in the treatment of mental disease. To authorize a physician to certify to the insanity of a patient, he must be a graduate of some incorporated medical college, a permanent resident of the State, and have been in the actual practice of his profession for at least three years ; and he must have obtained from a judge a certificate of the existence of these qualifications. He may then act as an examiner in lunacy. It has been urged that a physician who possesses merely the statutory qualifications is not really qualified at all to say whether a person is insane or not, and that a layman could form an opinion just as valuable. But probably very few cases occur in which a certificate of lunacy is given by a physician who does not know something more

about insanity than is necessarily implied in the simple statement that he has practiced medicine three years. And it is to be observed that the certificate of which we are speaking is not a final determination that the person whom it concerns is insane. It is more like a complaint, containing a statement of facts which, if true, authorize a temporary detention, at least, of the person against whom the complaint is made. The law contemplates a further inquiry into the mental condition of the alleged lunatic, either by a commission *de lunatico inquirendo*, the medical member of which can be a specialist, or before a jury in open court, where specialists can be called as witnesses. In view of the purpose of the certificate, the requirement that it must be concurred in by two physicians and approved by a judge, and the fact that it is not final or conclusive, I doubt the expediency of changing the law so as to demand evidence of greater special knowledge on the part of physicians before permitting them to act as examiners in lunacy.

But they should be more careful than is commonly the case in the preparation of the certificates. Time and time again, I have found certificates of lunacy chiefly made up of positive statements of fact which proved to be known to the signer only by the vaguest hearsay. The law exacts care from those whom it authorizes to prepare and execute these documents. A physician is not justified in certifying to the insanity of a person whom he is called to see, simply because some member of the patient's family gives him a long history of the hallucinations of the invalid, or because some other doctor assures him that the man is mad. He must examine into the case himself, to the best of his ability, and in the light of all the medical knowledge he possesses. If he does this, he will incur no liability even for an erroneous judgment. If he does less than this, and certifies that a person is insane who turns out to have been sane at the time, he can be held responsible by the injured party. Too much care can hardly be taken by physicians in the preparation of lunacy certificates, or by judges in passing upon them when presented for approval. In my opinion, the judge should always require the attendance of one of the physicians before him, if not both, and should personally inquire as to the facts in addition to the matters set out in the certificate. I am aware that some physicians deem it a hardship to be compelled to attend court for this purpose, but such doctors should let others act in their stead. The approval of the certificate by the judge was not intended to be only a formality. In fact, no act in the administration of this portion of the lunacy laws can properly be deemed a mere matter of form.

Notwithstanding the laxity which I have criticised, I know of no good reason to suppose that there is a single sane person held in restraint as a lunatic to-day under the laws of the State of New York.

The popular distrust of the management of lunatic asylums, however, has always been so great, and the horrors attending the incarceration of a sane person in a mad-house appeal so vividly to the imagination, that the State could well afford to do something to assure the public from time to time that none but lunatics are prisoners in these institutions. This might be accomplished through the supervision of the courts, to whose care the interests of all persons of unsound mind are expressly committed by statute. If in each of the five judicial departments into which the State is divided, the Supreme Court were empowered to appoint a qualified expert in insanity every year, whose duty it should be personally to examine every person imprisoned as a lunatic within that department, and report the results of his examination to the court, it would be rendered tolerably certain that no abuses were being perpetrated, and the assurance would be worth all it might cost in the way of compensation to the five physicians for their services.

As the title of this paper indicates, it has been my purpose only to touch upon some of the numerous relations which exist between scientific experts and the courts; and I have considered only those which came most readily to mind upon receiving your request to speak to you to-night. I have not attempted to discuss the proposition so frequently put forward and so earnestly advocated in medical circles, that experts in medicine or other sciences ought to occupy a judicial or quasi-judicial position in the administration of justice, instead of acting merely as witnesses, as they do under our existing system. While I see no prospect of any change of this sort, and should not be prepared to favor it if I did, I desire to mention a fact within my own experience and that of some of my associates on the bench, which indicates that an expert witness, of whose fairness and impartiality both parties are convinced, will often speak with an authority which is almost judicial. In a number of cases where questions of insanity have arisen upon habeas corpus proceedings, and the judge, at the request of all persons interested, has himself chosen and designated some medical man of high standing and acknowledged attainments to examine into the mental condition of the petitioner, the conclusion of the expert has been acquiesced in, not only without dissent, but often with expressions of positive satisfaction from every one of the various parties concerned in the inquiry.

Thus far I have spoken only of scientific experts as actual participants in trials or other judicial investigations. In the near future, however, they will be called upon in this State to exercise a new function, in devising the exact method of inflicting capital punishment under the recently adopted amendment of our law relating to the execution of the death penalty. The requirement of the statute is that the punish-

ment of death must be inflicted "by causing to pass through the body of the convict a current of electricity of sufficient intensity to cause death." The precise way in which this is to be done is not prescribed by the law, which is wholly silent as to details. Plainly, these must be thought out and perfected by experts in electrical science; and I am assured by one of the foremost electricians in the country that it will be by no means easy to overcome the practical difficulties in the way of enforcing the death penalty in accordance with the new law. In the experiments which must precede any execution thereunder, the State officials should not rest content with the advice of any but those who can speak with the highest authority in respect to the practical applications of electricity. For many centuries hanging has been the method by which capital punishment has been inflicted in England, and hanging has prevailed with few exceptions as the legal means of enforcing the death penalty in this country; although, in some jurisdictions, other methods have been permitted, as in Utah, where a few years ago, at least, the territorial laws allowed a person convicted of a capital offense to choose, with the sanction of the court, whether he should suffer death by being shot, hanged or beheaded. Without attempting now to discuss the sufficiency or the validity of the reasons which have led to the abolition of hanging in this State, it must be conceded that the ultimate public judgment as to the wisdom of the change to electricity will depend largely upon the practicability and effectiveness of electrical executions; and it is obvious that if the new system is to be successful, it can only be made so by the intelligence and effort of scientific experts.

Singularly enough, however, the people are not to be informed in what manner the new method works—at least, not through the agency of the press. The Legislature has resolved upon one of the most important changes in the method of inflicting the death penalty which has ever been attempted in any civilized country, and yet has forbidden the newspapers from publishing any account of the details of an execution under the new law, beyond a simple statement of the fact that the convict was duly executed. I think the propriety of this prohibition is open to grave doubt, irrespective of any question as to the liberty of the press. Unless the circumstances attending the infliction of capital punishment by means of electricity are made known to the public, how will the community at large be able to form any intelligent judgment as to whether its law-makers have done wisely in adopting this novel and almost untried method of putting murderers to death? The endeavor to repress publications which tend to cultivate a morbid curiosity should not be carried so far as to prevent the people from readily finding out how their own laws are administered in respect to the gravest offense of which those laws take cognizance.

BROOKLYN VITAL STATISTICS FOR THE YEAR 1888.

By J. S. YOUNG, M.D., Dep Commissioner of Health.

Data of Comparison:

Population, estimated January 1, 1889	814,505	The number of Births reported was	15000
Inhabited houses, about.....	94,000	The number of Marriages reported was.....	7500
In the year 1888 there were 18061 Deaths, the rate of mortality being 22.72 per 1000 of population.		The number of Still-births reported was.....	1277

The Mortality, by classes and by certain of the more important diseases, was as follows:

Causes:

1. Zymotic.....	4593	Malarial Diseases	201
2. Constitutional	3425	Diarrhoeal Diseases (all ages)....	1762
3. Local.....	8173	“ “ (under 5 years).....	1553
4. Developmental.....	1353	Phthisis.....	2056
5. Violence.....	517	Bronchitis	785
Measles	59	Pneumonia	1663
Croup.....	391	All Respiratory	2803
Diphtheria	984	Bright's Diseases.....	459
Scarlet Fever.....	475	Puerperal Diseases.....	163
Typhoid Fever.....	153	Old Age.....	321
Whooping Cough.....	194	Suicide.....	75

Reported Cases:

Diphtheria.....	2540	Measles	951
Scarlet Fever.....	2880	Typhoid Fever.....	463

During the year 373 cases of small-pox were reported, of which number 373 were confirmed as small-pox; 336 cases of small-pox were sent to hospital. Thirteen deaths from small-pox occurred in the city, and in the hospital 60.

Deaths, by sex, color, and social condition, were as follows:

Male.....	9346	Married.....	4456
Female.....	8715	Single.....	11315
White.....	17733	Widows.....	1445
Colored	328	Widowers.....	621
Native	12880	Not stated	224
Foreign	5181		

Still-births, excluded from list of deaths, were as follows: 1277.

Males	750	Total	1277
Females.....	527		
Deaths in public institutions.....	1281	Homicides.....	13
Deaths in tenement houses	7282	Suicides.....	75
Inquest cases.....			1545

Age Periods:

Deaths under 1 year.....	4944	Total deaths, 5 to 20.....	1565
“ “ 5 years	3075	“ “ 20 to 40.....	3040
Total deaths under 5.....	8019	“ “ 40 to 60.....	2762
		“ “ 60 and upwards	2675

Certain foreign and American cities show the following death-rates for the year 1888:

Brooklyn.....	22.72	Vienna.....	26.06
New York	26.18	Paris.....	23.46
Philadelphia	20.72	London.....	16.99
Berlin.....	25.38	Glasgow.....	23.05
Dublin.....			24.61

BROOKLYN VITAL STATISTICS FOR JANUARY 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Data of Comparison :

Population, estimated January 1, 1889..	814,505	The number of Births reported was ..	1398
Inhabited houses, about.....	94,000	The number of Marriages reported was ..	533
In the month of January there were 1535 deaths, the rate of mortality being 22.31 per 1000 of population.		The number of Still-births reported was ..	131

The mortality by classes and by certain of the more important diseases was as follows :

Causes :

1. Zymotic.....	309	Malarial Diseases.....	13
2. Constitutional.....	261	Diarrhoeal Diseases (all ages).....	4
3. Local.....	808	“ “ (under 5 years).....	4
4. Developmental.....	121	Phthisis.....	166
5. Violence.....	36	Bronchitis.....	98
Measles.....	27	Pneumonia.....	207
Croup.....	26	All Respiratory.....	331
Diphtheria.....	127	Bright's Diseases.....	43
Scarlet Fever.....	41	Puerperal Diseases.....	15
Typhoid Fever.....	5	Old Age.....	30
Whooping Cough.....	34	Suicide.....	4

Reported Cases :

Diphtheria.....	338	Measles.....	750
Scarlet Fever.....	352	Typhoid Fever.....	18

Deaths by sex, color, and social condition were as follows :

Male.....	753	Foreign.....	475
Female.....	782	Married.....	387
White.....	1504	Single.....	945
Colored.....	31	Widows, Widowers, and not stated.....	203
Native.....	1060		

Still-births, excluded from list of deaths, were as follows :

Males.....	68	{ Total.....	131
Females.....	63		
Deaths in public institutions.....	131	Homicides.....	
Deaths in tenement houses.....	746	Suicides.....	4
Inquest cases.....			122

Age periods :

Deaths under 1 year.....	322	Total deaths 5 to 20.....	145
Deaths under 5 years.....	325	“ “ 20 to 40.....	261
Total deaths under 5 years.....	647	“ “ 40 to 60.....	246
		“ “ 60 and upwards.....	236

Certain foreign and American cities show the following death-rates for the month of January, 1889 :

Brooklyn.....	22.31	Vienna.....	20.47
New York.....	25.24	Paris.....	23.57
Philadelphia.....	18.33	London.....	22.08
Berlin.....	19.02	Glasgow.....	26.22
Dublin.....			28.42

RESPONSIBILITIES OF DOCTORS.

Judge Rufus B. Cowing, of the City Court, discussed "The Responsibility of the Physician under the Law" last evening before the New York Society for Medico-Scientific Investigation. One of these responsibilities, to which he devoted considerable attention, was that imposed upon the physician when he appeared as a witness, and the Judge was of the opinion that it was not right that a doctor should be called into court, required to give, first, the facts in a medical case and then the opinion he based upon them, and be paid fifty cents for his trouble.

Judge Cowing also took up the once prominent question of whether a doctor had the right, under certain circumstances, to shorten the life of a patient, and the audience applauded him when he quoted and indorsed Judge Noah Davis's opinion that, outside of legal process, under no circumstances does a human being possess the right.—*N. Y. Times*.

NOT LIFE, BUT DEATH.

A number of the daily papers of this country have recently cited the following interesting story, taken from the Aroostock *Pioneer* as furnishing an instance of the power of the mind in prolonging life: A young married man, who was married last fall, had pneumonia. His wife was in Minnesota, where he had intended to join her soon. A telegram was sent to her and she arrived in season only to see her husband alive. He seemingly fought against death to see her once more. As she entered the room he rose in bed and remarked, "I wanted to see you and am now willing to go." After these words were spoken he fell back upon the pillow, turned upon his side and expired.

It seems a pity to spoil such an interesting and romantic story; but the fact is that it illustrates, not the power of mind in prolonging life, but the peril of physical exertion when life is trembling in the balance. The poor fellow no doubt precipitated his death by rising in bed; and he might perhaps be living to-day, and have missed newspaper fame altogether, if he had kept on his back.—*Medical News*.

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 6.

BROOKLYN, N. Y., JUNE, 1889.

WHOLE NO. 18.

ORIGINAL ARTICLES.

DISINFECTION.

BY G. M. STERNBERG, M.D.,

General Director of the Hoagland Laboratory.

A Lecture delivered at the Hoagland Laboratory, Feb. 25, 1889.

As I announced last Saturday evening the subject of my lecture this evening is "Disinfection," and of course we disinfect with disinfectants.

The first question that presents itself is, what is a disinfectant? The old idea was, even among physicians ten or fifteen years ago—and the popular idea to-day is—that the value of a disinfectant can be determined by the nose test, and anything that will destroy bad odors was supposed to be a disinfectant. This is still the idea among many people, but we can not accept this definition. A disinfectant, from our point of view, is an agent which will destroy infectious material, *i. e.*, destroy its infecting power. An agent which destroys bad odors is a deodorant. An agent which arrests putrefactive decomposition is an antiseptic. But antiseptic and disinfectant are not synonymous terms, although they are often so used. An antiseptic is an agent which prevents putrefactive decomposition, but it does not necessarily kill the germs of putrefaction.

If I want to test the value of an antiseptic substance, I take a putrescible liquid—for example, milk, or beef tea—which, when exposed to the air in a warm room, will undergo putrefaction. By adding a certain proportion of some chemical agent, such as sulphate of zinc, chloride of zinc, sulphate of iron, etc., and making a series of experiments, I find the minimum quantity of any one of these salts that will prevent putrefaction occurring in this putrescible liquid when freely exposed to the air. In this way I determine the antiseptic value of the agent. But if I want to determine its disinfecting power, that is, its germicide power, I must take a different course. I must take a fluid which already contains the germs which I am going to use as a test. They may be common putrefactive organisms, or the germs of some specific disease, as cholera or typhoid fever. Taking a culture of any of these disease germs the question is, what proportion of a given agent will destroy the vitality of the micro-organisms contained in it. That will depend on various conditions: in the first place upon the proportion of the disinfecting agent; next, upon the time of exposure to this agent; and in the next place it will depend very largely upon the nature of the material associated with the germ and upon its quantity.

For instance, if I take a given quantity of a two per cent. solution of carbolic acid, and it is a question of destroying a certain micro-organism, it is evident that if I put one drop of culture solution containing this micro-organism, say the typhoid bacillus, into this solution of carbolic acid, it is a very different matter from adding a large quantity of the same culture. In other words, it is necessary to consider the relative quantity of material to be disinfected.

Then again it makes a difference whether the culture is made in beef infusion or in milk, or in a medium containing a large amount of albuminous material.

Before referring to the various disinfectants, we must consider for a moment what it is we have to destroy and where this material is found. The nature of infectious material has been amply illustrated in my previous lectures. I have gone over the more important disease germs and you have found (those of you who have been present at these lectures) that in the sputum of tuberculous patients there is a bacillus which is the infectious agent, and in the excreta of typhoid fever and cholera there are micro-organisms which are the infectious agents in these diseases. In the pus coming from an acute abscess there are other organisms; and in diphtheria the bacillus is found in the false membrane in the throat. Now this is the kind of infectious material we have to destroy; and where do we find it? In the first place, in the sick-room. For in small-pox and scarlet fever and measles and

other personally contagious diseases, in which the infectious agent is given off from the surface of the body, we know the infectious agent is produced only by the sick person. There is no evidence that the germ of small-pox or of scarlet fever multiplies independent of the body of the sick person, so if you could destroy all the infectious material coming from the sick you would effectually stamp out these diseases. Then there are other diseases like cholera and typhoid fever in which the infectious agent multiplies in the body and also externally to the body. In these diseases if you sow the seed outside of the body, when the conditions are favorable you will reap an abundant harvest; where filth abounds these germs are sure to multiply.

So in the first place you have infectious material in the sick-room, next in fomites; that is, in the clothing and bedding of a person who has been sick with an infectious disease. In the next place, in privy vaults and sewers and places where infectious material has been thrown and which in that way have become infected. Then, again, wells and running streams may become contaminated by surface drainage in a locality where infectious material has been thrown out on the surface, or from being too near an infected vault; and this is one of the most common methods by which typhoid fever and cholera are propagated.

Then, again, you find infectious material in food products; milk may be infected by being diluted with the water of an infected well, or from the vessels used in the dairy having been washed in such water, and we have ample evidence that in that way typhoid germs have often been spread about.

Now as to the tests of disinfection. As I have already intimated the best test is the pathogenic organism itself, and it is evident that it is desirable to have tests made on every known disease germ in order to ascertain the exact proportion of the various disinfecting agents which will destroy these pathogenic organisms. Numerous experiments have been made in this direction, but in some cases we do not know the pathogenic organism. In small-pox it has not been demonstrated, so we must do the best we can, and we may use vaccine virus as a satisfactory test; anything that destroys vaccine virus should destroy small-pox virus. And so in hydrophobia, it is demonstrated that a temperature of 60° C. will destroy hydrophobia virus; and various *chemical* agents may be tried upon the same virus. When we take a virus of this kind in which the specific infectious agent has not been demonstrated, the test should be made by inoculating susceptible animals. A certain amount of virus is exposed to the disinfecting agent and afterwards inoculated into a susceptible animal. If after repeated experiments no results follow inoculations with such a virus, we know that its virulence has been destroyed by the disinfecting agent.

Again, we may use non-pathogenic organisms as our test, and some of these are shown by experiment to have far more resisting power than the known pathogenic organisms.

So when I take a quantity of broken down beef tea, which has undergone putrefaction and contains a great variety of micro-organisms—having been exposed to the air—some of which form spores, I take a more difficult test, and all our experience goes to show that any chemical agent which will destroy such non-pathogenic germs, will always destroy pathogenic micro-organisms. There are certain very common bacilli which form spores of great resisting power, more than any of those of the known disease germs.

Various methods have been employed. Koch, who was one of the pioneers in this line of research, took a standard solution of the disinfecting agent, and used the spores of the anthrax bacillus as the test organism. The spores were attached to silk threads. In a two per cent. solution of carbolic acid, for example, several of these threads were placed, and at the end of twenty-four hours he would take one thread out and place it in a suitable culture medium to see whether the spores would grow; if so, the disinfection was not complete. At the end of forty-eight hours he would again take out a thread and submit it to the same test, and so on.

In this way he determined *the time* required to destroy the vitality of anthrax spores by a given percentage of various agents.

These experiments are very interesting from a scientific point of view and very important pioneer work, but they do not serve by themselves for practical purposes. We can not say that because anthrax spores on a silk thread in a tumblerful of a five per cent. solution of carbolic acid are killed at the end of ten days, that this same solution may be used in practice where there is a large amount of infectious material associated with organic matter, as in the excreta of patients with typhoid fever or cholera. In order to have a practical basis for our work in disinfection, when I commenced my experiments I adopted a different method. I fixed the time—two hours was adopted as the standard—and I adopted the plan of using an equal quantity of the disinfecting agent in solution, and of the culture material containing the germ or test organism. (In my earlier experiments I used broken down beef tea and the spores of anthrax. These spores are the most difficult to destroy of all the known pathogenic germs.) For instance, 5 c. c. of broken down beef tea and 5 c. c. of a 4 per cent. solution of carbolic acid were mixed in a vessel, protected from atmospheric germs, and allowed to stand for two hours. If I used a 4 per cent. solution of the disinfecting agent that was diluted one-half by the material to be disinfected; so practically we have a 2 per cent. solution.

I have spoken of another method of testing disinfectants, viz.: by inoculation into susceptible animals. For instance, in testing gaseous disinfectants the gas is collected in a bell jar in a given proportion (a certain number of volumes per cent.) and ivory vaccine points are suspended in this bell jar for a given time. I always make it a point to make an experiment in duplicate and to make a control, and this method was followed in my experiments upon vaccine virus. If the vaccine virus should not take on children never vaccinated the test would go for nothing, so we suspend two points in the gas which we are testing, while two other points from the same lymph are retained for a control experiment. The test is made by vaccinating in one arm with the disinfected point, and in the other arm with the non-disinfected point; so we get a test of the susceptibility of the child from the non-disinfected point and at the same time of the reliability of the virus. If we get a good result on one arm and a negative result upon the other, it is evident that the negative result is due to the previous treatment of the disinfected point.

I have also made numerous experiments with the virus of sputum septicæmia, which, as I have told you, is probably the infectious material in pneumonia. I took the blood of an animal just dead with septicæmia (which proved to be very virulent, the smallest quantity of it introduced under the skin of a rabbit causing death in forty-eight hours); 2 or 3 c. c. of this blood was mixed with the disinfectant, and allowed to stand for the time fixed and then inoculated into a rabbit. If the animal died and the septic micrococcus was found in its blood, it was evident there was a failure to disinfect. If the animal showed no ill-effect from the inoculation, it was taken as evidence that disinfection was complete. But here comes a fallacy that lessens to some extent the value of experiments of this kind. I found when the amount of the disinfecting agent was not quite up to the point of destroying the virus that it was sometimes modified in such a way that the animal might be sick for a little while and then recover, and it would be recorded as a successful disinfection experiment, whereas the germ had not actually been destroyed, it had simply been attenuated, or its virulence modified. In making experiments by this method this point should be kept in view.

Among the germicide agents which have been tested I will first mention *light*. We have experiments by a number of different observers upon the germicide power of light, and it is a very interesting fact that exposure to the bright sunlight destroys pathogenic organisms, independent of the heat of the sun; experiments have been made to show this. Taking two tubes, one of which is enveloped in tinfoil to exclude the light, but which receives the heat in the same way as the

other; in the one which is exposed to the bright sunlight the germs in certain cases are destroyed—in some instances in quite a short time. Duclaux found that certain micro-organisms are destroyed in twelve hours' time when exposed to the sun during June and July. He found that dry spores were destroyed in two months when exposed in a dry condition. These spores can be kept indefinitely when put in a dark place in a dry condition. Another observer, Arloing, found that the spores of anthrax in bouillon were killed in two hours; whereas the anthrax bacillus required from 27 to 30 hours. It was a strange fact that the anthrax bacilli which had grown out withstood the light longer than the spores. The explanation is supposed to be that the spore just at the moment of sprouting is more tender and more easily killed than the bacilli after they are in full development and multiplying by binary division. He found by putting these same spores in water that they were not killed; it was only in a suitable culture medium that the light had this effect on them. By the electric light spores in bouillon were killed in one hour. This shows us that in sunlight we have a sanitary agent of great importance; a fact which has long been recognized by sanitarians, and now we have experimental data to support this well recognized fact.

Many of our most useful disinfectants act as oxidizing agents. Permanganate of potash is a disinfectant because it oxidizes organic material. The oxygen present in the atmosphere, diluted as it is, is a disinfectant of considerable value. Most microorganisms in a dry condition, if suspended in the air, lose their vitality very promptly. It has been shown by Braidwood and Vacher that vaccine virus is destroyed in seven days when exposed to oxygen, and we have many experiments to show that pathogenic germs are attenuated in their virulence by being kept, and after a time lose their vitality when exposed to oxygen. The time varies for different organisms and depends upon whether they are in a dry or moist condition.

Desiccation.—The cholera spirillum is destroyed in a few hours by desiccation. The typhoid bacillus takes a longer time; but exposure in a dry condition to oxygen is one of the most effective ways of destroying this and other pathogenic organisms. This is one reason why it is a good thing to keep a house dry. These microbes appear to flourish in moist places, while many of them are absolutely unable to retain their vitality in a dry atmosphere. So when we go back from the coast on the high dry lands of the interior, not only are many of these infectious diseases (especially those that prevail as an epidemic) almost unknown, but one may hang up a piece of meat in the open air in western Kansas or Arizona, and instead of becoming putrid it becomes desiccated, and is preserved; and that is the way the Indians preserve their meat in those regions.

We come next to *Heat*. I have already spoken of this in my lecture on "Sterilization," and in speaking of the various disease germs I have spoken of the value of heat as a disinfecting agent. You know that the ordinary process of preserving fruits and vegetables is by heating them up to a certain point and putting them in cans or bottles from which the air has been excluded. Exact experiments made by myself and others have shown that the cholera spirillum is destroyed at a temperature of 52° C., the anthrax bacillus at 54° C., the typhoid bacillus at 56° C., the bacillus of glanders at 55° C., the bacillus of swine-plague (rouget) at 58° C., the streptococcus of erysipelas at 54° C., vaccine virus at 54° C., and hydrophobia virus at 60° C.

It is easy to remember that all of these pathogenic organisms and the different kinds of virus referred to are destroyed at a temperature of 60° C., which is 140° F. If, then, we had such infectious material in a vessel, a very simple way to disinfect it would be by means of boiling water; to be on the safe side, say four times as much as the material to be disinfecting. Spores require a much higher temperature. The spores of anthrax require the boiling point for four minutes. I consider these spores to be the most difficult test that we are justified, in the present state of our knowledge, in applying for practical purposes. There are certain common bacilli found in the soil, the spores of which resist a much higher temperature; and the Germans have experimented to some extent with these difficult spores, some of which require a temperature of 15° C. above the boiling point for their destruction. But in practical disinfection we are not dealing with material of that kind. We are dealing with such material as I have spoken of, in regard to which we have exact information as to the thermal death-point; and the boiling-point of water is sufficient for the destruction of such infectious material.

In giving practical directions for disinfection by boiling. The Committee on Disinfectants of the Public Health Association has fixed one-half hour as the standard time, either for the material itself or for fomites or infected clothing, and with this I think you may feel perfectly safe. So also with food and milk or water which you suspect of being infected; boiling for half an hour's time, or even for a few minutes, will probably be entirely safe. For the disinfection of articles which cannot be immersed directly in water at the boiling-point, steam may be used. Woolen clothes hung up in proper rooms prepared for the purpose may be exposed to steam without receiving any serious injury. As I told you in my lecture on "The Sterilization of Culture Media," flowing steam is more effective than steam confined. Superheated steam acts like dry air, which does not destroy micro-organisms at anything like so low a temperature. It takes

130 to 140° C. to destroy the spores of anthrax in dry air, and dry steam acts much in the same way. It is therefore a mistake to construct a disinfecting apparatus to use superheated steam. Various inventors have made disinfecting apparatus on this principle, supposing the higher the temperature the better, but it is not so in the case of steam. Steam under pressure, however, is more effective than steam at the ordinary pressure of the atmosphere. This is a different thing from steam which passes through pipes and is superheated, as the engineers say, and which they speak of as dry steam.

Let us now consider the chemical agents which are most useful for disinfecting purposes. We may perhaps divide these into two classes, the oxidizing and the toxic disinfectants. This is not a classification that I insist upon, however, because, when I say that certain agents appear to be toxic to these disease germs, I simply admit that we do not know how they act. For instance, carbolic acid destroys disease germs, and, so far as I know, the acid does not undergo any change, whereas the oxidizing disinfectants all undergo a change themselves. When you use permanganate of potash as a disinfectant, it takes a certain quantity to disinfect a given quantity of infectious material, and the permanganate of potash is decomposed in the chemical reaction which occurs; and it is so with the oxidizing disinfectants generally.

In some cases it is desirable to have a volatile disinfectant, with which we can fill an apartment or ship which is supposed to be infected, which may penetrate to every crevice and crack, thoroughly disinfecting and destroying all infectious material. Unfortunately we have no agent of this kind which quite comes up to what we might desire. Chlorine gas is the most effective gaseous disinfectant without doubt, but there are certain disadvantages in its practical application; it is irritating, corrosive, and bleaches and destroys fabrics. It would not do, for instance, to turn chlorine gas loose in one of our nicely finished ships, as it would do a great deal of damage to paint and brass work, and also to the hangings and furniture; but where it is applicable it is the best gaseous disinfectant.

Some nine years ago I made exact experiments upon vaccine virus by the method already referred to, and found that one-half of one per cent. (one-half of a volume to one hundred volumes of air space) in six hours would destroy vaccine virus. I made the test upon four children, vaccinating in one arm with disinfected virus, and in the other with non-disinfected, and got a negative result in all four from the disinfected points, the control in all four being positive. The French observers Arloing, Cornevin, and Thomas, tested chlorine gas upon the virus of symptomatic anthrax, and found that when fresh it

was destroyed by this gas, but was not destroyed when in a dry condition. Fischer and Proskauer tested chlorine upon dry anthrax spores, and found that $44\frac{7}{10}$ parts to the hundred were effective in twenty-four hours' time; but the moist spores were destroyed in one hour, in an atmosphere containing four volumes to the hundred; and in an atmosphere containing one volume to the hundred moist spores were destroyed in three hours; the micrococcus tetragenus by one to two thousand five hundred, time twenty-four hours; micrococcus of erysipelas by one to two thousand five hundred, time twenty-four hours: tuberculous sputum was destroyed by five to one thousand in one hour's time. In connection with the other experiments mentioned, this shows us that in chlorine we have a most reliable gaseous disinfectant when it is used in the presence of moisture.

The gaseous disinfectant which has been most extensively used is sulphur dioxide, or sulphurous acid gas, made simply by the combustion of sulphur. My experiments with this gas, made in 1880, showed that one per cent. was sufficient in six hours' time to destroy vaccine virus upon ivory points, in a dry condition. The test was made upon five children.

I made numerous experiments in 1885, at the John Hopkins University, with SO_2 in a closet of a given capacity which could be hermetically closed. My test organism was put upon absorbent cotton and exposed in various ways. Micrococci were destroyed by ten volumes per cent. when in a moist condition, but they were not destroyed when dry. These micrococci are the simplest test, and we must demand that they be *absolutely* destroyed by any agent which we propose to use for disinfecting purposes.

In a second experiment with ten per cent. of SO_2 , steam was introduced into the chamber; but the spores of anthrax were not destroyed, neither were micrococci which were on pledgets of cotton in the pocket of a coat hung up in the room. In a bell-glass experiment with twenty per cent of SO_2 , micrococci, moist and dry, were destroyed in eighteen hours. This is five times as much as is ordinarily used in disinfecting apartments. Four volumes per hundred is about what you get by burning three pounds of sulphur to the thousand cubic feet of air space. Koch found that the anthrax bacillus attached to silk threads, in the presence of moisture, is destroyed in one hour by forty-eight volumes to one thousand.

In experiments made with an aqueous solution of SO_2 , I found that one to two thousand destroyed micrococci in two hours. The use of sulphur dioxide for general purposes of disinfection has been nearly abandoned in Germany. In this country it is still extensively used, and is recommended by the Committee on Disinfectants, of which I

was chairman ; but it is rather upon the evidence furnished by practical sanitarians than upon the experimental evidence I have given you here. This evidence shows that in the presence of moisture it is an effective agent for certain purposes and under certain conditions, and we did not feel justified in excluding it from our list, inasmuch as many sanitarians who have used it extensively after cases of scarlet fever, typhoid fever, and small-pox believe that they have satisfactory evidence that they have prevented the extension of these diseases by disinfecting the premises with this agent, and in view of the fact that the specific infectious agent in these diseases has not been demonstrated.

A most valuable chemical disinfectant, and the one which the Committee on Disinfectants has placed at the head of the list, after boiling water, is a four per cent. solution of chloride of lime. Numerous experiments were made by the Committee in 1885, and since that time again, under my direction, by Dr. Bolton, the results of which show the great value of this agent. The bacillus of typhoid in bouillon is destroyed by one to two thousand ; the cholera spirillum in bouillon by one to one thousand ; anthrax spores in bouillon by one to one thousand.

It is cheap and may be purchased by the quantity for three and one-half cents a pound ; you can get a pound package from the drug store for fifteen cents. The proportion recommended by the Committee on Disinfectants is six ounces to the gallon of water.

But you must be sure that you have good chloride of lime. Our tests showed that the common article, as put up in cans and jars, as a rule is of good quality, but it must be in hermetically sealed packages. The disinfecting power of this agent depends upon the hypochlorite of lime present in it ; this is an oxidizing agent and must be used in excess. If not, your hypochlorite of lime is destroyed by the organic material present, and after that, if there is an excess of organic matter containing pathogenic germs, you will not have disinfected the whole material, and not to disinfect the entire amount is equal to not disinfecting any of it. There can be no partial disinfection ; unless complete it cannot be considered disinfection.

Next upon our list we have *mercuric chloride* (corrosive sublimate), which is recommended, in solution of one to five hundred, for the destruction of material containing spores. Numerous experiments which I have made with this agent show that it destroys various micrococci in the proportion of one to ten thousand, the cholera spirillum in one to ten thousand, the typhoid bacillus in one to ten thousand ; Yersin says the tubercle bacillus is destroyed by a solution of one to one thousand in ten minutes. This salt is an antiseptic in very much smaller quantities, and prevents the development of pathogenic

micro-organisms as well as the germs of putrefaction. For instance, with the spores of anthrax in a suitable culture medium, one part in three or four thousand will prevent development. You have beef-tea, say, in which the spores would grow abundantly in twenty-four hours; by adding one to three hundred thousand of the bichloride their development is prevented, and the culture medium remains clear and transparent.

La Place has shown that the addition of tartaric acid to the sublimate solution is advantageous. He found that putrefying pus and blood which contained the pus micrococci did not form a precipitate when tartaric acid was added (one to one thousand bichloride of mercury and five to one thousand tartaric acid). This he found was effective in the presence of a considerable amount of albumen. A solution of bichloride of mercury of one to one thousand is probably the most valuable and most useful solution for washing surfaces and scrubbing floors and woodwork, and for disinfecting the hands and surfaces generally, and also as a solution in which to immerse clothing which cannot be boiled. For instance, in the sick-room you are not prepared to send soiled clothing at once to the laundry, and indeed it might not be safe to do so. You should therefore have a proper receptacle containing a solution of one to one thousand bichloride of mercury in which to immerse soiled clothing; allow it to remain one or two hours, or longer, before sending to the laundry.

Sulphate of copper is a valuable disinfectant in the absence of spores, and is comparatively cheap, though not so cheap as the bichloride of mercury. According to the experiments made by Dr. Bolton for the Committee on Disinfectants, the typhoid bacillus is destroyed by one to two hundred, the cholera spirillum by one to five hundred, pus micrococci by one to one hundred, the erysipelas coccus by one to five hundred. Sulphate of copper, like the bichloride of mercury, is less effective in the presence of a considerable amount of albumen. It does not destroy spores; my experiments and those of Koch correspond in this respect. We have given this the eighth place in the list, recommending a five per cent. solution.

Sulphate of iron is not a disinfectant of any value. My experiments show that while it is a good deodorant, it is not a disinfectant. A ten per cent. solution failed to destroy micrococci in two hours; a five per cent solution failed to destroy anthrax spores in six days. These and other experiments show that the sulphate of iron is untrustworthy, and its use for disinfecting purposes has been generally abandoned.

Sulphate of zinc likewise has no great value. A ten per cent. solution in two hours' time failed to destroy micrococci, and yet this is one of the agents that not many years ago had quite a prominent place as

a disinfectant. A twenty per cent. solution did not sterilize broken down beef-tea.

Chloride of zinc: A two per cent. solution destroyed pus cocci in two hours. A ten per cent. solution did not destroy anthrax spores in two hours. A five per cent. solution in two hours' time was successful with broken-down beef-tea; so in the absence of spores it is within certain limits an effective disinfectant, and we give it the ninth place, recommending it to be used in ten per cent. solution.

Carbolic acid, in the absence of spores, is a most effective disinfecting agent, and we have put it seventh in the list, below mercuric chloride, although for many purposes it is preferable to this salt. It is now generally used in Germany for the disinfection of the excreta of typhoid and cholera patients. It is not itself destroyed, and may be left indefinitely in contact with the material to be disinfected. Experiments show that a one per cent. solution destroys the cholera spirillum and the typhoid bacillus, as well as the various pus micrococci. So when we direct the use of a five per cent. solution we think we are on the safe side, and it has the advantage of being quite as effective in the presence of albumen as in its absence. It destroys spores after a very long exposure. La Place states that the addition of hydrochloric acid adds to its disinfecting power for spores; while the carbolic acid alone required twelve days, four per cent. of crude carbolic acid and two per cent. of hydrochloric acid destroyed anthrax spores in one hour.

La Place speaks of "crude" carbolic acid. All my experiments show that crude carbolic acid is not reliable, and what I have said above about the germicide power of this agent has reference to the pure acid.

The following are the conclusions of the Committee on Disinfectants, to which reference has been made:

CONCLUSIONS.

Agents for the Destruction of Spore-containing Infectious Material.

1. Fire, complete destruction by burning.
2. Steam under pressure, 105° C. (221° F.) for ten minutes.
3. Boiling water for half an hour.
4. Chloride of lime,¹ a four per cent. solution.
5. Mercuric chloride, a solution of one to five hundred.

Agents for the Destruction of Infectious Material not containing Spores.

1. Fire, complete destruction by burning.
2. Boiling in water for ten minutes.
3. Dry heat, 110° C. (230° F.) for two hours.

¹ Containing at least twenty-five per cent. of available chlorine.

4. Chloride of lime, a two per cent. solution.
5. Solution of chlorinated soda,² a ten per cent. solution.
6. Mercuric chloride, a solution of one to two thousand.
7. Carbolic acid, a five per cent. solution.
8. Sulphate of copper, a five per cent. solution.
9. Chloride of zinc, a ten per cent. solution.
10. Sulphur dioxide,³ exposure for twelve hours to an atmosphere containing four volumes per cent. of this gas in presence of moisture.

BACILLUS TUBERCULOSIS AND DIATHESIS IN PULMONARY PHTHISIS.

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Read before the Brooklyn Pathological Society, May 9, 1889.

In looking over the *Brooklyn Medical Journal* for 1888, my attention was attracted by an article in the October number by Dr. Isaac Hull Platt, "On the Relation of the Bacillus Tuberculosis to Pulmonary Phthisis," and ever since reading I have felt constrained to answer it, not that I wish to respond to the writer's appeal for a drubbing, but because I feel that he voices a mistaken sentiment, which, unfortunately, is entirely too prevalent among the profession.

Before presenting this paper to the Pathological Society, I feel that I ought to offer a word of explanation, as it would not be overstrained to regard it as a breach of delicacy to take a paper read before one society, and answer it before another, of which I am not even sure that the author is a member. My justification for so doing is simply this, that I must insist upon it that this paper is not a personal answer to Dr. Platt, but simply a correction of a false idea which prevails more widely than it should.

The subject is one which is of the greatest interest to the profession as a whole, and, therefore, may be discussed anywhere, apart from personality; moreover this paper will appear in the same journal as did his, and thus reach the same circle of readers, so that I think there will be no valid cause for complaint.

² Containing at least three per cent. of available chlorine.

³ This will require the combustion of between three and four lbs. of sulphur for every 1,000 cubic feet of air space.

My only reason for putting this paper in the form of an answer to Dr. Platt is, that he has stated his case so forcibly and championed it so warmly that I can do better by taking his own words as an exponent of the sentiment to which I object, than by restating the case myself and referring to him and to others who have written in the same strain. He says:

"It may seem presumptuous in one who has done no work in the field of bacteriology to enter into the discussion of the microbic origin of phthisis, and I do not doubt that there are many ready to deny my right to speak on the subject. But the great battle now raging in the arena of medical science is of such absorbing interest, that I feel that I must join in the fray if only for the satisfaction of receiving a drubbing, which will very likely be my fate, as I seem to be enlisted on the side of the minority.

"My warrant for speaking upon the subject at all I take to be that a complex problem like that under discussion cannot be determined simply by the observation of facts, no matter how skilful and accurate the observers. The facts must be scrutinized and weighed, subjected to analysis and synthesis, for which work, experience in practical bacteriology does not seem to be a necessary prerequisite.

"It is impossible to overrate the importance of an understanding as thorough as possible of the nature of pulmonary consumption. Out-numbering, among civilized nations at least, every other malady in its victims it is perhaps of all chronic diseases, with one or two exceptions, the most amenable to judicious treatment. Exalted as is the position which I suppose we must claim for the scientific spirit of the medical world, we are not entirely exempt from fashions, furors, crazes, even such as hold sway in the lower spheres of the social and political worlds, and just now the rod of iron under which we needs must bow is the omnipotent and terrible bacillus.

"Without attempting to belittle the work of the great pathologists of our times in the field of bacteriology, I believe that the brilliancy of their discoveries has to a great extent blinded us to a just perception of other factors in the ætiology of disease, of no less importance than those which they have demonstrated for us.

"Accepting, then, as proven, that the bacillus tuberculosis is the immediate determining agent in the production of tubercle, and that in its absence tubercle cannot exist—which seems to be all that the most ardent bacteriopathist can claim—do we by this admission concede it to be of supreme practical importance ætiologically or clinically? Is it the factor of supreme importance in reference to the prevention and treatment of pulmonary consumption? So far from this being the case I believe it to be but one link in the chain of causes which leads up to

the disease ; and as my warrant for this belief, I appeal to the teachings of direct experiment, of pathology, of clinical experience, and of common sense."

The author then goes on to adduce evidence from direct experiments, from pathological researches and from clinical experience, to show that the tubercle bacillus is not the only factor of importance in the ætiology of phthisis, and concludes as follows :

"In still another way does clinical experience militate against the theory of the exclusive importance of the microbic factor in the ætiology of the disease ; and this is in reference to the results of treatment. Ever since the discovery of the bacillus tuberculosis the profession has run mad on microbicides in the treatment of phthisis. Innumerable schemes for destroying the organisms have been devised, all to result in failure. In the few cases where they have apparently done good, as in the case of gaseous enemata, it has been not by acting as microbicides at all, but by either allaying symptoms or exercising some beneficial influence upon the constitutional condition of the patient. On the other hand, the results of treatment directed to improving the general condition of the patient, as will be seen by Dr. Kretschmar's paper describing Dr. Dettweiler's sanitarium at Falkenstein, are truly surprising ; and it is in this view of the subject that its full importance becomes evident. The importance of not allowing ourselves, in our enthusiasm about the bacillus, to forget the other factors of the disease, the proper recognition of which is of the greatest importance in reference to prophylaxis and treatment.

* * * * *

"I do not doubt the value of the light thrown upon the ætiology and pathology of disease by bacteriology, but what I deprecate is the tendency to neglect as valueless the results of the painstaking investigation of years, because a new ætiological factor is found which it is immediately assumed accounts for everything."

Surely, from the foregoing, one would imagine that the bacteriologists had discovered the tubercle bacillus and were attempting to bulldoze the profession into believing that it, and it only, was an ætiological factor in pulmonary phthisis ; that the clinicians were at variance with the bacteriologists and were attempting, in the face of opposition, to establish the claim of predisposition to a share in the importance of the causation of this disease. Now there is nothing farther from the truth than just this supposition, and I think it well worth while to quote from several of the leading authorities on bacteriology to show what they really do teach on the subject. Before making these quotations, I wish to call particular attention to the fact that the line of work in which these gentlemen are especially engaged is practical experimental bacteriology.

In the paper referred to, the author says: "A complex problem like that under discussion cannot be determined simply by the observation of facts no matter how skilful and accurate the observers. The facts must be scrutinized and weighed, and subjected to analysis and synthesis, for which work experience in practical bacteriology does not seem to be a necessary prerequisite."

While fully agreeing with the author, that practical experience in bacteriology is by no means requisite for logical analysis and synthesis, I emphatically maintain that many of the most suggestive facts bearing on this subject are to be learned from practical bacteriology and from practical bacteriology alone. The truth is that in reading the Doctor's paper, I often wished that I could lead him into the bacteriologist's sanctum, and give him the choice of many additional facts to strengthen his defence of the importance of the role of predisposition in the ætiology not only of phthisis, but of all zymotic diseases.

We have evidence of great vital differences which are far beyond the range of microscopic distinction, and in animals so closely allied that we would be apt to regard them as one. For instance, the bacillus of glanders kills field mice, but has no effect upon house mice. *Micrococcus tetragonus* (sometime found in connection with the tubercle bacillus in sputum) kills white mice, but not gray ones. Field mice are immune to mouse septicæmia, while ordinary mice die. This led Koch to the discovery of the coccus of progressive tissue necrosis. When he inoculated ordinary mice with septic material, they died of septicæmia, without the process of necrosis becoming prominent as a separate trouble. As soon as his inoculations were made on field mice, they were found to die from a new disease involving wide-spread necrosis of the tissues around the point of inoculation. This, then, gave him a perfectly easy method of getting the coccus of progressive tissue necrosis separated from that of mouse septicæmia, for the latter has no effect upon gray mice. This is one of the most useful methods of separating pathogenic organisms from harmless saprophytes, and from each other, and is used every day in the laboratory. The practical bacteriologist is constantly brought to see that certain animals resist organisms which are fatal to others. Even the deadly anthrax, which has killed sheep by the thousands, yearly, is powerless against one species of sheep, the Algerian; and timid little white rats may also defy its power. What is it that gives species so clearly allied such widely different resisting power? May we not consider that there is a kind of *diathesis* for certain diseases in one species, but not in another.

The author quotes a series of experiments by Trudeau,¹ to show the influence of hygienic surroundings on the power to withstand the action of a pathogenic bacillus. I will quote the Doctor's own synopsis of the experiments.

"Fifteen healthy rabbits were divided in three lots. Each of the first lot of five was inoculated in the right lung and left side of the neck with a culture of the bacillus tuberculosis.

"Each of the third lot was inoculated in precisely the same manner. The members of the second lot were not inoculated.

"The first lot of inoculated rabbits were confined in a small box in a dark cellar, and stinted in the quantity of food allowed them. The second lot of animals (uninoculated) were placed under similar conditions, except that they were placed in a pit in damp ground instead of in a cellar. The third lot of animals, inoculated precisely like the first, were turned loose on a small island in June, and in addition to the grass and green shrubs which the island afforded, they were daily provided with fresh vegetables.

"Of the first lot of rabbits four died within three months, the remaining one was killed at the end of four months. In all, the lungs, and in all but the last survivor, the other organs were extensively involved in the tuberculous process. The five uninoculated rabbits placed in the damp pit were all living at the end of four months. They were emaciated and their coats were rough, but when they were killed and their organs examined they were all found to be healthy. So far the results were as would have been anticipated, and only go to confirm previous observations. The interest centres on the fate of the third lot.

"One of the five rabbits which were allowed to run at large died just one month after inoculation. The lower portion of the lung was solidified, the bronchial glands enlarged, and a few tubercles could be made out in the spleen. The left lung and all the other organs were sound. The four other rabbits remained apparently in perfect health, and so active had they become that two of them could only be captured with the aid of a gun. All four animals were killed at the beginning of November, or four months after inoculation. They were loaded with adipose tissue and their flesh was so firm and red as to be in striking contrast to the blanched and flabby muscles of the other rabbits previously examined. All the organs were healthy, and even the points of inoculation could not be made out.

"Here, then, we have the evidence of direct experiment showing the extreme importance of environment in the determination of the

¹ Am. Jour. Med. Sciences, July, 1887.

tubercular disease. Environment in this case being the complex of many factors. The first lot of rabbits were not only inoculated with the microbes, but were deprived of light, fresh air, exercise, and sufficient food, and were subjected to dampness and foul emanations. Of the five inoculated rabbits which were allowed to continue their existence under their natural hygienic surroundings, but one succumbed to the disease, and in estimating these results the extreme susceptibility of rabbits to tuberculosis is to be remembered."

These experiments are very suggestive. Lot one shows that rabbits with the tubercle bacillus and bad hygienic surroundings are likely to die with tuberculosis. Lot two shows that bad hygienic surroundings *without the tubercle bacillus failed to produce tuberculosis.*

Lot three showed that *the system may withstand and conquer the tubercle bacillus, provided the hygienic surroundings are good.* Such experiments come from the field of *practical bacteriology*, and are very valuable, the more so that they do not stand alone.

Arlong,² found a certain bacillus which had no injurious effect when inoculated into healthy tissues, but which made sad havoc, and even caused death, when inoculated into tissues which were dying from insufficient nutrition. For instance, healthy testicles of sheep resisted the organism completely, but when the inoculation was made into testicles of rams which were being castrated by torsion, the testicle broke down, and the animal often died.

Streptococcus pyogenes when inoculated into healthy rabbits rarely produce any effect, but if the rabbit be weakened by previous injection of toxic substances, the streptococci grow with great rapidity, and the animal dies with all symptoms of septicæmia.

Wyssokowitsch has further found that the same coccus when injected into a vein will do no harm, but if the valves of the heart be lacerated by an instrument run down the jugular vein and then withdrawn, the rabbit will die in a few days with well-defined endocarditis.

The post-mortem table furnishes as clear proof as any that in man, as well as in the lower animals, the system may overcome the attack of the tubercle bacillus even after it has taken a firm hold in the lung. I have repeatedly seen such cases where the old tuberculous mass lay incapsulated and harmless for years, bearing witness to the transient weakness but permanent strength of the surrounding tissues.

Now, having glanced at some of the facts with which practical pathology and bacteriology make us familiar, let us turn to the writings of those men who are brought most in contact with these facts, and see whether they "are blinded" and ascribe everything to the tubercle bacillus and too little to predisposition.

² Comptes Rendus, vol. cvii., p 1167.

We would naturally turn to Koch, as the first worthy to be quoted, as he was the discoverer of the tubercle bacillus, and we have to thank him for the most important contribution to our knowledge of the subject. We find that he clearly recognizes the role of predisposition as early as 1883, for we quote from his far-famed report to the Imperial Board of Health as follows :³

“Derselbe Körper, welcher bei der Invasion der Tuberkelbacillen einen günstigen Nährboden für dieselbe abgab, so dass sie sich vermehren und ausbreiten konnten, allmählig diese Tuberkelbacillen günstigen Eigenschaften verliert, sich in einem schlechten Nährboden verwandelt und dem ferneren Wachsthum der Bacillen eine Grenze setzt. Es bestand also in demselben Menschen zeitweilig eine Disposition für Tuberculose und zeitweilig wieder nicht.”⁴

Such a quotation needs no comment, and shows that even the discoverer of the bacillus has no disposition to withhold from any factor its due. Turning now to France, we refer to that well-known text-book of Cornil and Babes, and find that these authors also fully recognize the proper role of predisposing causes. They write :

“Nous avons insisté surtout, dans ce court chapitre relatif à l'étiologie, sur la rôle initial et essentiel des bacilles ; mais la nature du terrain ou ils vont germer, les causes prédisposantes qui consistent surtout dans les vices de l'hygiène, le surmenage, les conditions morales, etc., n'en sont pas moins importantes à connaître et à étudier. Il est vrai qu'on ne peut pas non plus donner le pas à ces causes banales et rééditer la phrase prétentieuse de Eidenmann que les tubercles sont les larmes de la pauvreté versées à l'intérieur du corps.”⁵

Turning now to our own country, I quote from Prof. Welch, of the Johns Hopkins University, who is at the head of the departments of pathology and bacteriology there. In speaking of infectious diseases in general, he says :⁶

³ Mittheilungen aus dem kaiserlichen Gesundheitsamte, Band 2, p. 84.

⁴ “The same body, which, at the invasion of the tubercle bacillus furnished a favorable soil for its growth, so that it could multiply and spread, gradually loses these peculiarities favorable to the tubercle bacillus, changes into an unfavorable soil, and puts an end to the farther growth of the bacillus. In the same person, therefore, there exists a predisposition for tuberculosis at one time, and not at another.”

⁵ “In this short chapter on etiology, we have insisted throughout upon the primary and essential role of the bacilli ; but the nature of the soil in which they germinate, the predisposing causes, which are made up especially of bad hygiene, overwork, moral conditions, etc., are not less important to understand and to study. It is true that we cannot do better than accept the high-sounding phrase of Eidenmann, that ‘Tubercles are the tears of poverty shed on the inside of the body.’”

⁶ Quoted from Flint's Practice of Medicine, edition of 1886, pp. 194-195, the pathological part of which was written by Dr. Welch.

"An essential etiological factor in the causation of certain infectious diseases, in addition to the presence of specific organisms, is the existence of peculiar local conditions. These conditions constitute the predisposition to certain diseases. They may be distinguished as diathetic conditions. They are as essential to the development and multiplication of pathogenic organisms as the presence of the latter. Their removal is not less effectual for the prevention of infectious diseases than measures which are directly destructive to the organisms."

Speaking of phthisis in particular, he says: "The causes of pulmonary phthisis relate, first, to the specific micro-organism, the bacillus tuberculosis; and, second, to the conditions which constitute a tuberculous predisposition or diathesis. The disease is never produced without the parasite, but the efficiency of this agent depends on the predisposition or diathesis. The latter alone is incapable of producing the disease. If the introduction of the parasite into the air-passages could be prevented, the disease would not be produced, no matter how strong the predisposition; and, on the other hand, if the predisposition be wanting, the disease will not be produced, no matter how great the exposure to the specific cause. . . . The apparent incongruity between the proof of contagiousness afforded by inoculation in certain of the lower animals, and the uncertain evidence obtained by clinical observation, are to be accounted for by the fact that for the contagion to be effective the predisposition is requisite; and this predisposition does not exist in all persons, or at all times in the same person."

A statement of the case, more clear and impartial, could not be given. This author evidently is not blinded.

And now, in conclusion, let us quote from Flügge's *Microorganismen*, which is probably the best text-book on *bacteriology* extant. On page 614, we read:

"Den eclatantesten Einfluss einer individuellen Disposition sehen wie bei der Tuberculose; dort hat die grössere oder geringere Ausammlung der resistenten Erreger in der menschlichen Umgebung erfahrungsgemäss eine relativ untergeordnete Bedeutung für die Ausbreitung der Krankheit; der Zustand der Schutzvorkehrungen an den Eintrittswegen dagegen und namentlich der Ernährungszustand der Schleimhaut einen so bestimmenden und Maassgebenden Einfluss, dass es vielfach üblich geworden ist, fast ausschliesslich auf die Beseitigung der individuell disponirenden Momente (durch gute Ernährung, intensive Athembewegungen, u. s. w.) hinzuwirken und nicht wie bei

anderen infectiösen Krankheiten auf eine möglichst sorgfältige Entfernung der erregter Bedacht zu nehmen."⁷

It would be simply impossible to express Dr. Platt's position more strongly than Flügge here does it. Every one of the quotations given is from men whose daily work is directly in the experimental line, and these were not selected from a great many, but are simply given as those to which I have immediate access. They amply serve to show that those who are most thoroughly imbued with the "scientific spirit" are not affected by the "fashions, furors, and crazes" to which the doctor refers.

The fact is, that there are too many who get into the field of science who are wholly destitute of a true scientific spirit, and they go in there with motives anything but scientific. Their object is to raise (a) dust, and they generally succeed in doing this without raising anything better. These pseudo-scientists are the ones whose dust causes blindness, and we can only warn all interested to remember that when they see great clouds of dust being raised, it is safe to suspect that the agitator is only scurrying over the surface. *Deep mining always goes slowly*, and every foot of the shaft is strengthened before going farther. I admit that it is extremely annoying to be misled by sham scientific work, but the piper should only be paid by those who dance, and I object to having *bacteriology* saddled with such references as the author made in his paper. I do not know a single noted bacteriologist who claims that the tubercle bacillus "accounts for everything," and I think the author would also have hard work to find one.

To a great many, bacteriology means simply a study of the different forms of certain micro-organisms under the microscope, and a whole raft of methods for detecting these in sputum, fæces, and elsewhere. Some others know that there are such things as physiological methods of separating these microbes, and growing pure cultures which contain but one variety of organism. That the effect of inoculation of each of these distinct varieties on various animals is then noted, in order that an idea of the virulence or non-virulence of each organism may be determined as far as possible; but comparatively few realize that bacteriology is only a branch of the larger science of biology, and

⁷ "It is in tuberculosis that we see the most striking influence of an individual predisposition. Here the collection of a larger or smaller amount of the exciting cause in the human environment has a relatively subordinate significance for the spread of the disease. On the other hand, the condition of nature's precaution against the paths of invasion, namely, the condition of nutrition of the mucous membrane, is so definite and proportionate that it has widely become the custom, by good nutrition, full breathing, etc., to accomplish the removal of the individual predisposing causes and not, as in other infectious diseases, to pay especial attention to a most careful removal of the exciting cause."

just as we study the history of whole races of animals through geological ages, and observe the struggle for existence, so we must continue our observations down to the minutest living organized units, and see a fierce hand to hand fight between cell and cell, the result of which may in a few hours decide the fate of a human life.

The medical sciences have advanced so rapidly of late that one must be truly active to keep abreast of their progress. Every year sees important changes being made in the direction of a more thorough training of medical men in their student days, and it is highly gratifying to see that laboratories are beginning to spring up, where post-graduate facilities are also offered to those who were not so fortunate in their earlier instruction. While the greater part of the profession can never hope to find time to carry on extended researches in such laboratories, they can at least place themselves in a position to judge between work which is thoroughly reliable and that which is not. A man competent to form such a judgment is pretty sure to have eradicated any diathesis for suffering from fashions, furors, and crazes, and he may well take both satisfaction and pride in his immunity.

DEVELOPMENT OF THE CRYSTALLINE LENS.

BY DR. RICHMOND LENNOX,

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Read before the Brooklyn Medical Microscopical Society, April 4, 1888.

Development of the Crystalline Lens.—In preparing this paper for your consideration, it was at first my intention to speak of the development of the entire eye, but I soon realized that to do this with any attempt at clearness, would be to make far too great a demand upon your time and patience. So I have limited myself to the development of the crystalline lens, only going so far into the anatomy and embryology of the rest of the eye as has seemed necessary to make my subject clear. It will not be my privilege to add anything that is new to what is already known upon the subject, and the only claim to originality that I can make, is for the microscopical sections arranged before you, and for the drawings which accompany them. These will, I venture to believe, show satisfactorily the various steps in the development of the eye. For the material used in the sections represented in Figs. 13, 14, 15, 16 and 18, I am indebted to the kindness of Prof. J. Arnold, of

Heidelberg, in whose laboratory they were made. The remaining material is of my own collecting.

What is the body that we are about to study? What are the requirements that must be fulfilled, and how does Nature meet these requirements? In the first place, the lens must be transparent to allow the passage of light through it, and must have the proper shape to give the rays of light which have already been made convergent by passing through the cornea, the further deflection necessary to bring them to a sharp focus on the retina, and thus enable us to see clearly. This it must do not only for light coming from distant objects, but also from those placed closer to the eye. In other words, the lens must be capable of changing its shape, and by increasing the curvature of its surfaces, of increasing its refractive power. Its structure must be such as to require but a moderate nutritive supply, for there can be no blood-vessels in the lens. Blood-vessels would be incompatible with its transparency, and its nutrition must be drawn from the aqueous and vitreous humors between which it lies. The nearest blood-vessels to the adult lens are those in the ciliary processes, the summits of which are at least a millimeter away, and those in the pupillary margin of the iris, which, as you know, rests upon the anterior surface of the lens in all ordinary conditions of the pupil. During the embryological growth of the lens, however, the vascular supply is a much more intimate and abundant one, as we shall see later. What is the anatomical structure of the developed lens, that fulfills these requirements so perfectly? It consists essentially of three parts: first, a body made up of flattened hexagonal fibres united at their edges, so as to form lamellæ, which are wrapped about a central core or nucleus like the layers of an onion; secondly, a single layer of epithelial cells, covering the anterior surface of the lens's body; and lastly, a structureless, highly elastic capsule, surrounding the whole. The nucleus of the lens body is also made up of fibres similar to those in the periphery, but harder and with less interfibrillar cement substance, so that they are less easily separable, in consequence of which the centre of the lens forms a dense hard mass. The lens fibres are directed in a somewhat S-shaped course from before backward, and run in a general way parallel to the surface of the lens, being longer in the more superficial layers. In the periphery of the lens each fibre contains a nucleus, at about the middle of its length, but towards the centre of the lens the nuclei disappear. The epithelial cells covering the anterior surface of the lens body change their shape somewhat at its equator. They become elongated, curved, and finally assume the appearance of fibres; indeed, it is by this transformation of epithelial cells that the lens fibres are formed. The lens capsule is, as I have said, a structure-

less elastic membrane which encloses*the epithelium and the lens body completely. It is thicker in front than behind, and with the aid of certain reagents may sometimes be separated into two or even more layers, of which the outer is inseparably blended with the elastic fibres of the zonule of Zinn, or suspensory ligament of the lens.

Let us now consider the development of the lens and see how these different parts are formed; and in order that no step of the process may be omitted, let me rapidly recall to your minds the most essential changes that the ovum undergoes after leaving the Graafian follicle. The ovum consists at this time, as you know, of an enveloping membrane, known as the zona pellucida or vitelline membrane, containing the yolk in which are embedded the germinal vesicle and the germinal spot. It is really nothing but a highly developed cell, with limiting membrane, cell body, nucleus and nucleolus. Now impregnation occurs, and the process of segmentation begins, the protoplasmic yolk dividing dichotomously, until at last a mass of nucleated cells is formed, which spreads itself out under the vitelline membrane, until it forms a more or less complete lining to it, known as the blastodermic membrane. This blastodermic membrane consists, not of a single layer of cells, but of two layers, of which the outer is in rather the more advanced state of development. To these is soon added a third layer, occupying an intermediate position, so that we now find the blastodermic membrane made up of three layers of cells, which have received the following names: the outer layer, lying under the vitelline membrane, is known as the epiblast or ectoderm; the middle as the mesoblast or mesoderm; and the inner as the hypoblast or entoderm. In the development of the eye we have to do with the outer and middle of these layers only, and may consequently disregard the hypoblast entirely.

The further general changes in the ovum and the formation of amnion, allantois and chorion, interesting as they are, need not concern us here, and I will come at once to the development of the central nervous system, which is the next step toward the development of the eye. In fact the retina and optic nerve may be regarded as a part of the embryonic brain with quite as much propriety as the olfactory tracts and bulbs as part of the developed organ.

The formation of the brain and spinal cord begins by the appearance of a longitudinal groove in the outer surface of the blastodermic membrane (Fig. 1), deepened by a proliferation of the epiblastic cells on either side of it, known as the dorsal ridges, the central groove having received the name of the medullary groove. As development advances the dorsal ridges become more marked and approximate each other, until they finally meet and coalesce, thus closing in the medul-

lary groove and converting it into a tube (Figs. 2, 3). Gradually the mesoblast also proliferates and grows in around the medullary tube so as to separate it from what may be considered as the original layer of epiblast. We now have the central nervous system represented by the medullary tube derived from epiblast, but lying in and surrounded by mesoblast. The anterior closed extremity of the medullary tube, corresponding to what is to be the head of the fœtus, is somewhat expanded, and from it is derived the brain, while from the surrounding mesoblast are developed the brain membranes, the skull, subcutaneous tissues and cutis. The original layer of epiblast becomes the cuticle, and the central cavity of the medullary tube the ventricular cavity of the brain and the central canal of the spinal cord, which, as you know, are continuous at the lower extremity of the fourth ventricle.

We may now consider the fœtal head as consisting of a layer of epiblast, lined of course by mesoblast, in which is the anterior expanded extremity of the medullary tube that is to develop into the brain. The latter has become bent upon itself and constricted in places, the dilations thus formed being known as the cerebral vesicles (Fig. 30). It is from the anterior of these vesicles that the eyes take their origin. They begin by the appearance on either side of the vesicle of a bud-like offshoot, which rapidly increases in size and approaches the superficial layer of epiblast (Fig. 4). In the chick the budding optic vesicle comes in direct contact with the superficial epiblast, whereas in mammals they are separated by a thin layer of mesoblast. As it grows, the neck of the process becomes constricted, so that it soon assumes a bladder-like shape with its cavity communicating through the neck or pedicle with the cavity of the anterior cerebral vesicle from which it has sprung (Figs. 5, 6). This bud-like process is called the primary optic vesicle, and it is in the constricted pedicle that later the fibres of the optic nerve are developed. The primary optic vesicle is thus nothing more than a lateral diverticulum of the anterior cerebral vesicle, but it does not develop directly into the eyeball. On the contrary, further changes take place in it, as we shall see presently, so that it only forms retina, retinal pigment, and the pigmented epithelium of ciliary region and iris.

But we must now turn our attention to the changes which have been taking place in the superficial epiblast, opposite the primary optic vesicle. These concern us particularly as we are now to see the first trace of the fœtal lens. The epiblast at this point becomes thickened (Fig. 7), and a process of involution commences similar to that by which the medullary groove was formed, so that there appears in the epiblast a kind of pit or depression. Naturally there is a corresponding projection (at least in mammals in which there is an intervening

layer of mesoblast) of the epiblast into the mesoblast; and when the primary optic vesicle in its growth outward approaches this projection, its outer wall is pressed back against the inner wall and pedicle, so that the cavity of the vesicle is reduced to the narrow slit-like space which still communicates through the pedicle with the cavity of the cerebral vesicles. In the eye of the chick the primary optic vesicle comes in direct contact with the superficial epiblast, so that at the time of the involution of the outer wall of the vesicle there is no intervening mesodermic tissue (Figs. 6, 7, 29). This involution occurs not only from before backward, but from below upward, as is seen in Fig. 29, so that the vesicle loses its spherical shape and assumes that of a cup or hood with double walls. It is now known as the secondary optic vesicle. To carry out the comparison with a hood still further, one may say that the opening for the wearer's face is filled with the involuted epiblast forming the lens, while the opening for the wearer's neck is taken by mesodermic tissue which grows in from below to occupy the cavity of the hood—the cavity of the secondary optic vesicle (Fig. 31). This cavity is of course entirely different from that of the primary optic vesicle, the latter having been reduced to a narrow slit still communicating with the cerebral vesicle (Figs. 8, 10), while the former is more or less completely filled with the above-mentioned mesoderm. The space between the rounded edges of the hood or secondary optic vesicle is known as the foetal fissure, and is occupied in front by the thickened and involuted epiblast representing the lens, and behind by the process of mesoderm which extends from below into the cavity of the hood. These edges approximate quite rapidly, especially behind that portion which encloses the developing lens, so that at eighty hours (Fig. 26) they are nearly in contact, being separated by a narrow process of mesoderm only. Farther forward the fissure is filled with the lens (Fig. 28). In the further growth of the embryo there is a complete fusion of the edges of the foetal fissure, except in the anterior part which embraces the lens, this closure taking place in the chick from before backward, as may be seen by a comparison of Figs. 33 and 34. The process of involution which results in the formation of the foetal fissure is not limited to the primary optic vesicle alone, but extends backward a variable distance along its pedicle toward the cerebral vesicles. In earlier embryos (Figs. 23, 24, 25, taken from a chick of eighty hours), this pedicle is so short that transverse sections show an involution of its lower wall throughout, it being even indicated slightly in sections which still show its connection with the cerebral vesicle (Fig. 23). A few hours later (93 hours) transverse sections of the pedicle (Figs. 20, 21, 22) show one portion nearer the cerebral vesicle in which no involution has occurred (Fig. 20), the lumen of the pedi-

cle being here flattened. This involution produces a groove extending from the optic vesicle inward along the under surface of the pedicle for a greater or less distance. In this groove is mesoblast continuous with the mesoblast in the cavity of the secondary optic vesicle, of which cavity the groove may be regarded as but an extension. With the closure of the foetal fissure this groove allows of a communication between the mesoblast within and that without the secondary optic vesicle, and it is through it that the vessels going to the lens enter the eye.

We have seen how the epiblast folds itself inward to meet the advancing optic vesicle. The impression thus made deepens, its edges approximate and finally fuse; and we thus have a hollow, more or less circular mass of epithelial cells budding out, as one may say, from the inner surface of the epiblast (Figs. 8, 9, 10). This mass gradually separates itself from the epiblast, and becomes surrounded by mesoblast. It represents the embryonic crystalline lens. This stage of the development is reached at about the fourth week in the human embryo, or the third day in the chick.

The foetal lens now consists of a rounded bladder of epithelial cells, with walls that are about equally thick in its different parts. Soon the cells of the posterior wall begin to grow, and elongate into fibres, (Figs. 11, 12), so that the central cavity of the lens becomes much diminished in size and very soon obliterated, the central cavity having disappeared and the lens appearing solid at about the eighth week in the human embryo. This elongation of the cells into fibres takes place more rapidly at the centre of the posterior wall than at the periphery, which allows of a more equal filling up of the central cavity. In their growth, the lens fibres, as they may now truly be called, take a definitely fixed direction, those in the centre or axis of the lens being directed antero-posteriorly, while those in the periphery are curved in such a way that their concave side is turned toward the equator of the lens (Fig. 13). These curved fibres are shorter the farther removed they are from the centre of the lens, until at the equator itself they are little more than elongated cells, which are directly continuous with the epithelial cells forming the anterior wall of the originally hollow lens. Even at this early stage we really have all the elements of the adult lens—a lens body made up of fibres, an epithelium, which corresponds to the anterior wall of the hollow lens, the lens cavity being practically obliterated, and a lens capsule; for, even at this early period, we can in certain specimens distinguish the bright line surrounding the lens, which indicates that the capsule has commenced to form.

The characteristic foetal lens presents, however, certain differences in structure from that in the adult, which are well worth noting. In the first place the lens fibres all contain nuclei, and in the second place

their course is more or less an axial one, so that their ends abut against what there is of capsule at about a right angle. The concentrically laminated structure of the adult lens is brought about by the fibres, which develop later from the epithelial cells at the equator, arranging themselves parallel to the surface of the lens. To do this they have to grow over the ends of the more centrally placed lens fibres, between them and the capsule behind or the epithelium in front; and so we may very properly regard the early foetal lens as the nucleus of the developed organ. When we consider that new layers of lens fibres are being continually formed in this way, one theory of the origin of what is called zonular cataract seems very plausible. This theory is that the nutrition of the lens becomes affected in some way during embryonic life for a longer or shorter period, and as a result the lens fibres which develop at this time do not become transparent as they should. When the nutrition again becomes healthy, clear lens fibres are again formed. This process may repeat itself, so that we may have several strata of opaque substance in such a cataractous lens.

Such cataracts would naturally be congenital and stationary. Quite recently, however, Beselin, on the strength of a careful microscopical examination of a lamellar cataract, has upheld the view that the opaque areas in the lens are simply spaces between the lens lamellæ formed by the shrinking of the nucleus in consequence of a chemical change in its composition. These spaces are filled with granular detritus, and their formation may be accompanied by some granular degeneration of the lens fibres themselves.

The further development of the embryonic lens may perhaps be most easily followed in the drawings which accompany this paper. The lens epithelium thins itself out into a single layer of cells (Figs. 15, 17), and the lens fibres become still more elongated, their nuclei extending across the lens in a gently curved line known as the "bow of nuclei." Later the nuclei in the more centrally placed fibres disappear, and the bow becomes incomplete.

During the early periods of foetal life the growth is a very active one, and for this a very large amount of nutritive material is required. Indeed Huschke has found that the lens of a young child weighs about two-thirds as much as that of an adult, and it is easy to see that on account of the greater density of the adult lens a comparison of volume would show even a less difference.

Let us now see how it is that the nutritive material reaches its destination. As it must be derived directly or indirectly from the blood, this brings us to a consideration of the blood vessels about the foetal lens. We may start with the fact that all the blood vessels are of mesoblastic origin, and lie in mesoblastic tissue. We know that the

foetal lens is surrounded by such tissue, and in this there develops a network of vessels which closely invests it, and is well named the tunica vasculosa lentis. This is derived from the hyaloid or capsular artery (Figs. 15, 16), which enters the eye at the optic nerve through the groove already described on the under side of the pedicle of the optic vesicle, and passes directly forward through the mesoblastic tissue, representing the vitreous, to the back of the lens a little below the posterior pole, lying in its course in what is known as the hyaloid canal, a portion of which remains pervious even in the fully developed vitreous. On reaching the lens the hyaloid artery divides into a number of arterial twigs which spread themselves over its posterior surface, dividing repeatedly on the way. At the equator of the lens they curl over its edge upon the anterior surface, and are then directed toward its anterior pole. On the anterior surface of the lens there are numerous anastomoses with vessels coming from the iris and choroid. Many of the latter vessels have the appearance of veins, and as, according to the majority of observers, the hyaloid artery has no corresponding vein, it is highly probable that the blood of the tunica vasculosa lentis returns to the heart by way of the iris. The tunica vasculosa lentis is sometimes described as lying in a special membrane surrounding the lens. This however is not properly the case, except in the pupillary area after the anterior chamber has formed. Here we really do find a delicate mesoblastic membrane containing the vessels just described (Figs. 16, 18), a membrane which is continuous with the iris on either side, and which sometimes persists after birth as the so-called pupillary membrane. At the equator of the lens and behind, the blood vessels are contained in what is really the anterior part of the vitreous humor. The tunica vasculosa lentis exists as such some time before the iris begins to form, as is indeed only natural when one considers the very early and rapid growth of the lens. In its earliest stages the pupillary membrane, as the anterior part of the tunica vasculosa lentis is called, lies directly between cornea and lens in apposition with both. Toward the latter part of the pregnancy, fluid accumulates between the cornea and pupillary membrane, and thus the anterior chamber is formed. Let me make it perhaps a little clearer. We have seen how, after the separation of the lens from the surface epiblast, a certain amount of mesoblast grows in between them from the sides. This mesoblast tissue becomes thicker, and finally splits, if you please, into two layers—a thicker anterior which helps to form the cornea, and a thin posterior layer which is the pupillary membrane. The fissure between them becomes the anterior chamber (Fig. 16).

The tunica vasculosa lentis makes its appearance in the second month, and is best developed from that time until about the seventh

month. Then the vessels begin to disappear, and in the pupillary membrane there is also an absorption of the embryonal connective tissue supporting them. As far as we know, this absorption is not completed at any definitely fixed time, and all that we can say is that in new-born children either nothing remains or at most a few shreds of vessels near the margin of the iris.

There is considerable diversity of opinion about the formation of the lens capsule. Some say that it is of mesoblastic origin, others that it is a cuticular formation derived from the lens itself. The probability is that it owes its origin to both of these sources. We have seen that the developed capsule can be separated into laminæ, the outer of which is indissolubly connected with the fibres of the suspensory ligament. We know that this ligament is formed in mesoderm, and it is certainly natural to assume the same origin for the outer part of the capsule. But in birds the capsule may be made out even before mesoblastic tissue has covered the whole surface of the lens, and this is certainly proof positive that some of the capsule is of other than mesoblastic origin. The inner part of the capsule is probably a cuticular formation, derived from the cells of the lens itself, and this view is strengthened by the greater thickness of the capsule in front. The lens fibres having all their energies directed toward their own volumetric increase, are less capable of forming capsule than the comparatively unemployed cells of the anterior epithelium.

The embryonal differs from the adult lens in its approach to the spherical form. The axis reaches its full length even before birth, but the transverse diameter increases from birth, when it measures about seven millimeters, practically through life; hence the gradual flattening of the lens after birth. By this process of equatorial growth the foetal lens comes to be really the nucleus of the adult lens.

It is of interest to note that the nuclear changes indicating proliferation of cells are to be found in the anterior epithelium and not at the equator, and that the growth of the lens after birth is an appositional one with an actual increase in the number of lens fibres. Harting has found a somewhat different relation in the human foetal lens. According to him, there are no more fibres in the lens of a new-born child than in the foetus of four months, but the fibres are thicker and larger; so that, in at least the latter part of embryonic life, the growth of the lens would seem to be an interstitial one.

In old age there are very decided changes in the lens, such as flattening, sclerosis, and a yellowish discoloration especially in the central portions. The epithelium, which in newly born children is as high as the capsule is thick, becomes very much flattened, so that on section little more than nuclei are to be seen. There are also in many cases hyaline deposits on the capsule.

Altogether, when one considers the changes by which the epithelial cells become fibres, one is struck by the analogy there is between them and those that occur in ordinary epidermis. In both we have to do simply with epiblastic tissue. In the epidermis the cells proliferate in the deeper layers, and are forced outward toward the surface, losing their nuclei and becoming flattened and horny, until at last they are brushed or rubbed off by some external medium. In the lens the cells proliferate in the anterior epithelial layer, are pressed outward, changed into flattened fibres at the equator, and then gradually forced toward the centre of the lens by the new fibres succeeding them, where they lose their nuclei, and are pressed together in a sclerosed mass which gradually becomes harder, denser and less elastic with every year of life.

EXPLANATION OF PLATES.

FIGS. 1, 2, 3. $\times$ about 136 diam.

Transverse sections of back of embryo chick at the beginning of second day, showing medullary groove and tube. ep = Epiblast, mes = Mesoblast, hyp = Hypoblast, mg = Medullary groove, mt = Medullary tube resulting from the approximation and fusion of the edges of the medullary groove.

FIG. 4. $\times$ about 99 diam.

Transverse section of the head of embryo chick at the end of second day, showing primary optic vesicles before any marked constriction of the pedicles has taken place. ep = Superficial epiblast; mes = Mesoblast; cv, cv = Cavity of the cerebral vesicles; a, a = Wall of cerebral vesicles (epiblastic), continuous with wall of pov; pov, pov = Primary optic vesicle on either side.

FIG. 5. $\times$ about 99 diam.

Transverse section of head of embryo chick at the beginning of third day, showing further development of the primary optic vesicles. Lettering as in Fig. 4.

FIG. 6. $\times$ about 99 diam.

Transverse section of head of embryo chick at the beginning of third day, showing further development of the primary optic vesicles. Lettering as in Fig. 4.

FIG. 7. $\times$ about 99 diam.

Transverse section of head of embryo chick at the beginning of third day, showing commencement of lens and beginning involution of primary optic vesicle. ep = Superficial epiblast; mes = Mesoblast; cv, cv = Cerebral ventricles. A comparison with Fig. 30, which represents an antero-posterior section of an embryo at about this time, will show how readily certain transverse sections represent the cerebral vesicles as separated from each other. pov, pov, = Primary optic vesicles; b = Commencing involution of thickened epiblast to form lens. Corresponding to this there is already a beginning folding in of the outer wall of the primary optic vesicle, a process which is to lead to the formation of the secondary optic vesicle.

FIG. 8. $\times$ about 99 diam.

Antero-posterior section of eye of embryo chick at end of third day. The eyes at this time being directed laterally, a transverse section of the head would

cut the eyes from before backward, while antero-posterior head sections cut the eyes transversely. ep = Superficial epiblast; mes = Mesoblast; pov = Cavity of primary optic vesicle, now nearly obliterated, communicating with cv through neck of vesicle; cv = Cavity of cerebral vesicle; sov = Cavity of secondary optic vesicle; b = Involution of superficial epiblast to form lens vesicle.

FIG. 9. $\times$ about 99 diam.

Similar section to Fig. 8, but which does not pass through the pedicle of the optic vesicle, and consequently shows no connection between optic and cerebral vesicles. Lettering as in Fig. 8.

FIG. 10. $\times$ about 99 diam.

Antero-posterior section of eye of embryo-chick, third day, showing closure of the lens vesicle and further development of the secondary optic vesicle. ep = Superficial epiblast; mes = Mesoblast; cv = Cerebral vesicle; pov, pov = Cavity of primary optic vesicle; sov = Cavity of secondary optic vesicle, to become the vitreous chamber; a = Wall of cerebral vesicle; b = Involution of superficial epiblast to form lens.

FIG. 11. $\times$ about 99 diam.

Antero-posterior section of eye of embryo chick, fourth day, showing separation of lens vesicle from superficial epiblast, and commencing elongation of the cells of its posterior wall into fibres. ep = Superficial epiblast; mes = Mesoblast; a = Wall of cerebral vesicle; sov = Cavity of secondary optic vesicle nearly closed in front by lens vesicle. It will be noticed that the secondary optic vesicle has increased considerably in size. b = Cavity of lens vesicle; c = Proximal lamella of secondary optic vesicle (originally the inner wall of the primary optic vesicle), which is to become the pigment layer of the retina; d = Distal lamella of the secondary optic vesicle (originally the outer wall of the primary optic vesicle), to become the retina proper. The narrow slit between c and d is what remains of pov in the previous sections. In the fully developed eye it is a lymph channel between the layer of rods and cones and the retinal pigment epithelium.

FIG. 12. $\times$ about 99 diam.

Antero-posterior section of the eye of embryo chick, fourth day. ep = Superficial epiblast; pov = Slit-like space between distal and proximal lamellæ of secondary optic vesicle, originally the cavity of the primary optic vesicle; sov = Cavity of secondary optic vesicle; b = Cavity of lens vesicle, in the posterior wall of which there is a further development of the cells into fibres; mes = Mesoblast; c = Proximal lamella of secondary optic vesicle; d = Distal lamella of secondary optic vesicle.

FIG. 13. $\times$ about 99 diam.

Antero-posterior section of eye of embryo calf, 20 mm. long. ep = Superficial epiblast; sov = Cavity of secondary optic vesicle containing mesoblast and part of tunica vasculosa lentis; pov = What remains of the cavity of the primary optic vesicle; c = Proximal lamella of secondary optic vesicle, now much thinner and quite deeply pigmented, the pigmentation having apparently extended from behind forward; d = Distal lamella of secondary optic vesicle; b = Cavity of lens vesicle, nearly obliterated by the marked development of lens fibres; g, g = Folds of epiblast and mesoblast to form eyelids; h = Optic nerve developing in pedicle of original vesicle; mes = Mesoblast; a thin layer of which may be traced between lens and superficial epiblast, being here the beginning of cornea and pupillary membrane.

Fig. 1.

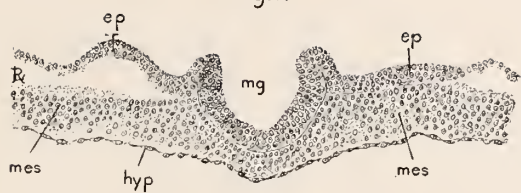


Fig. 2.



Fig. 3.

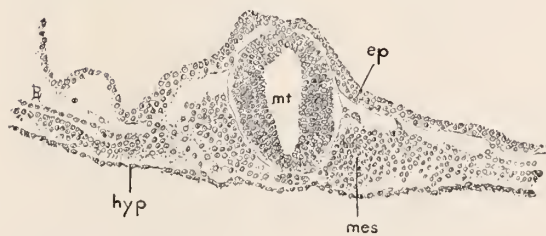


Fig. 4. ~

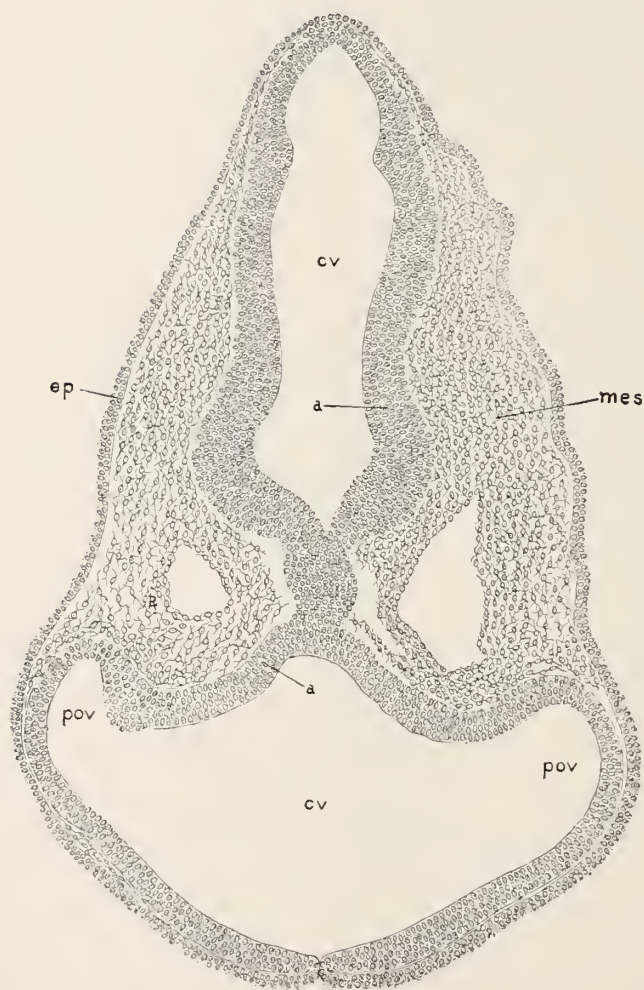


Fig. 5

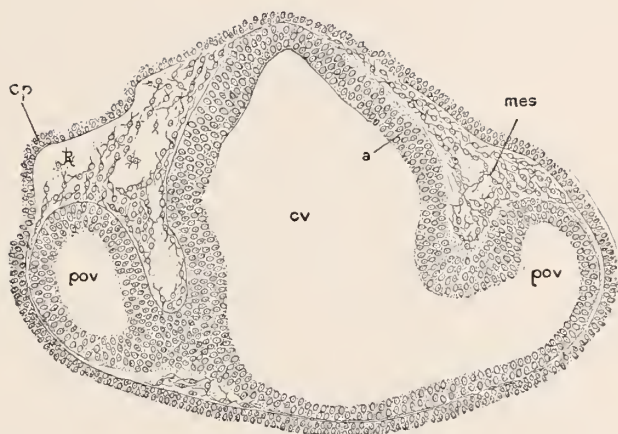


Fig. 6.

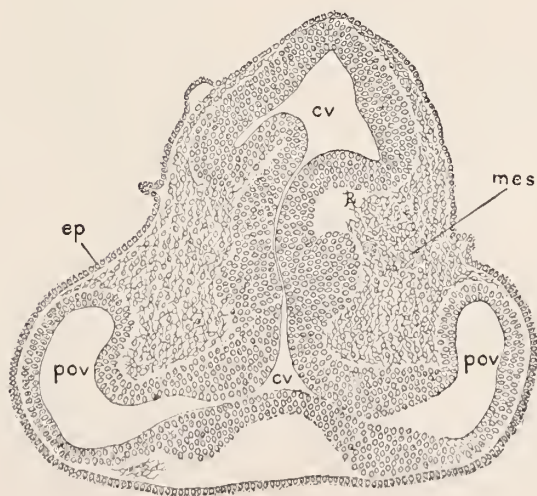


Fig.7.

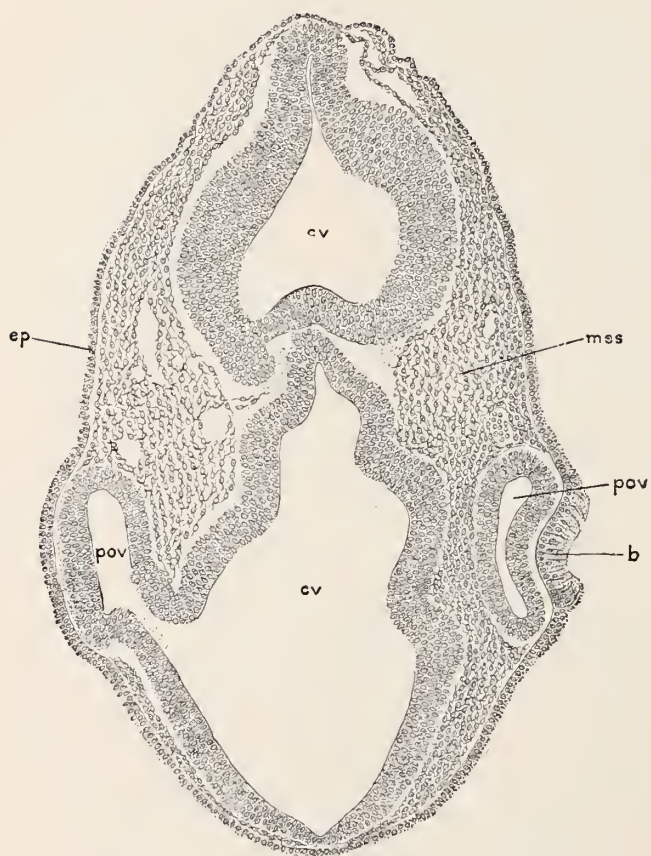


Fig 8

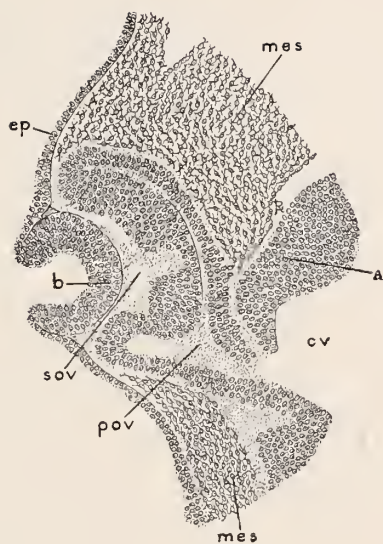


Fig. 9.

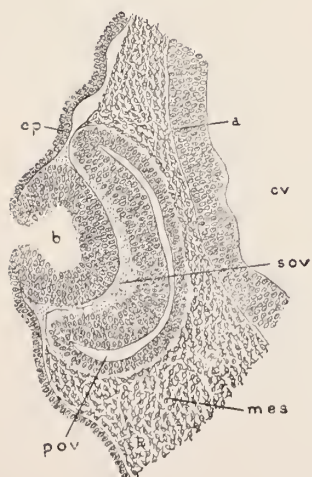


Fig. 10.

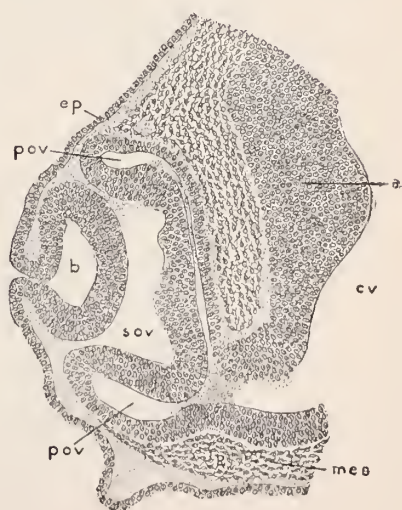


Fig. 11.

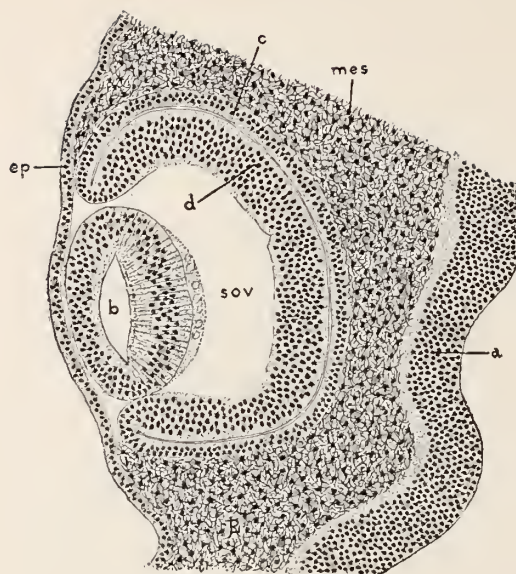


Fig. 12.

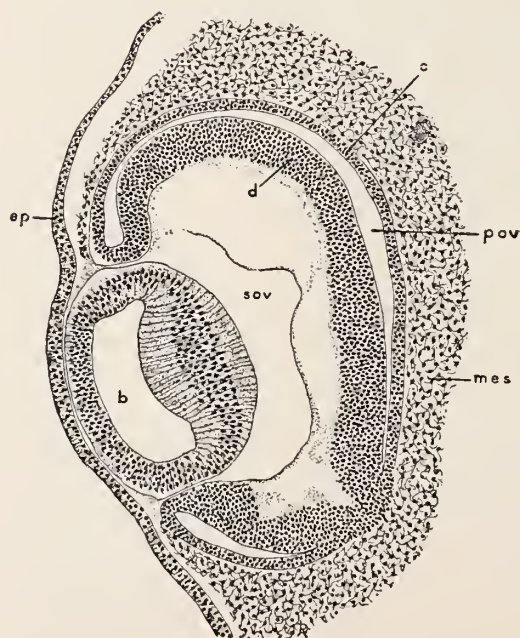


Fig.13.



Fig. 14.

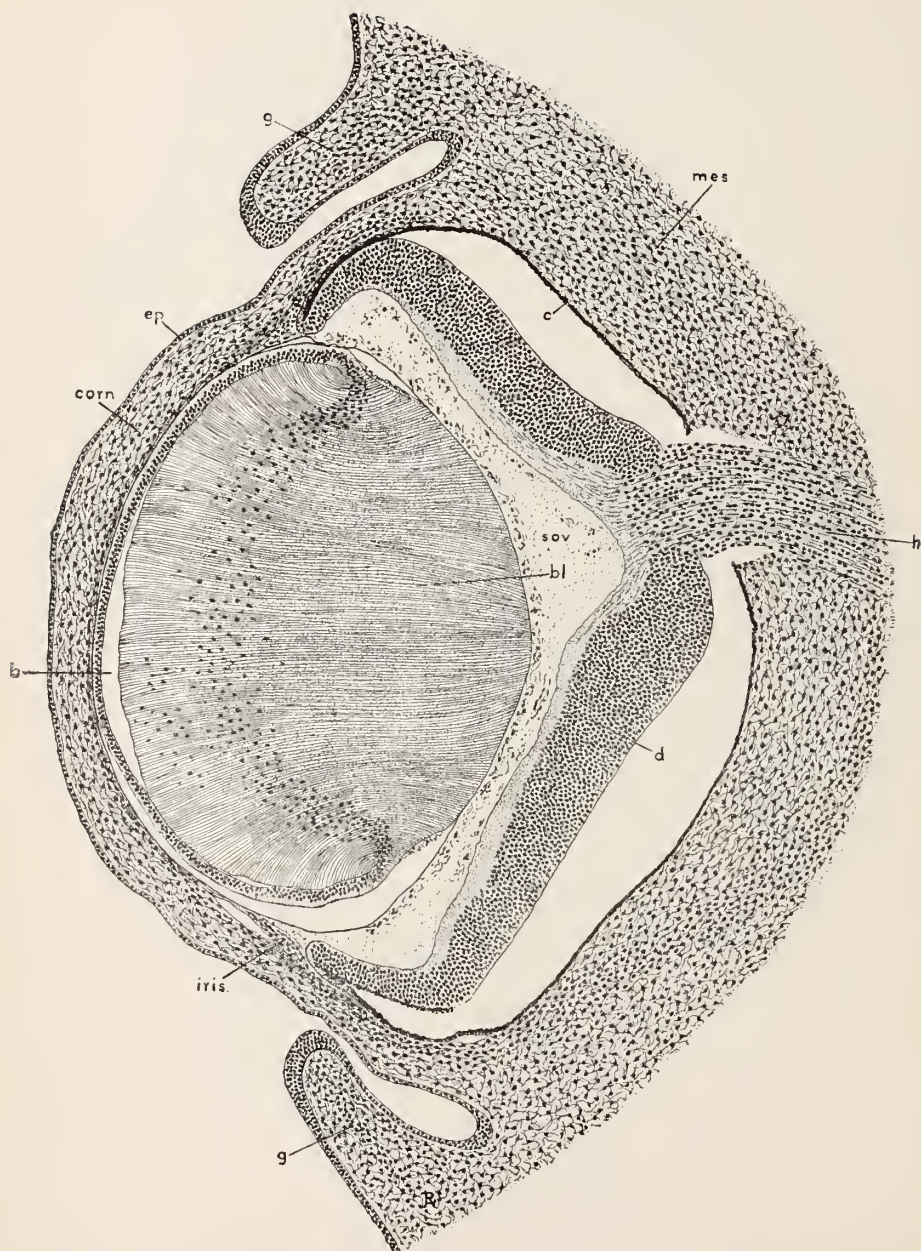


Fig. 15.

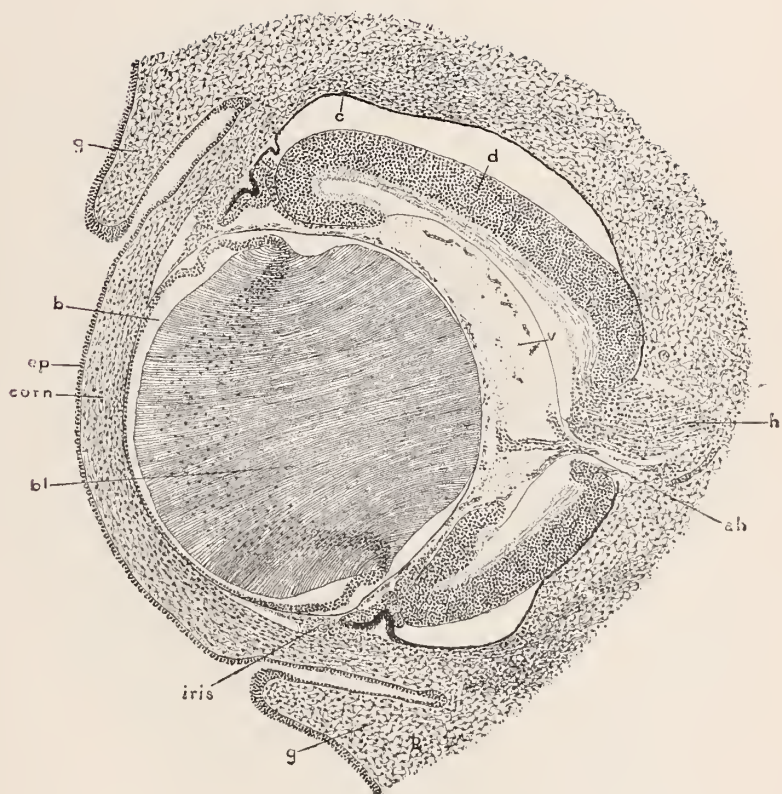


Fig.16.

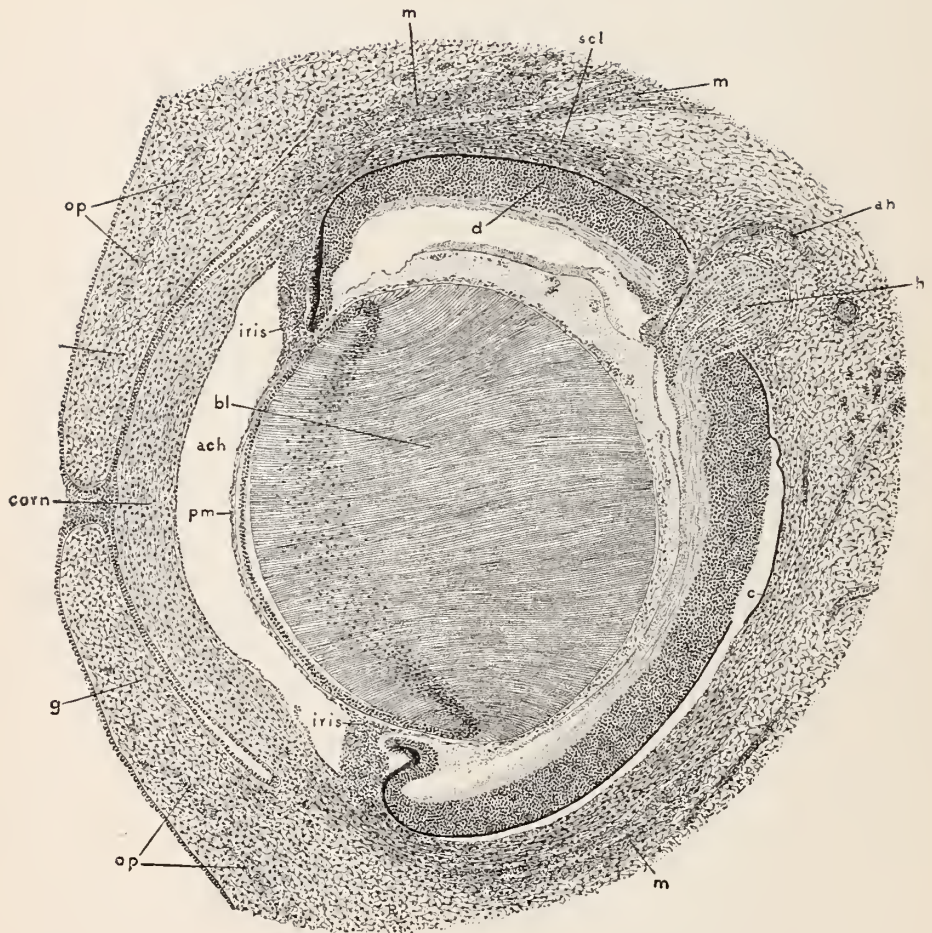


Fig.17.

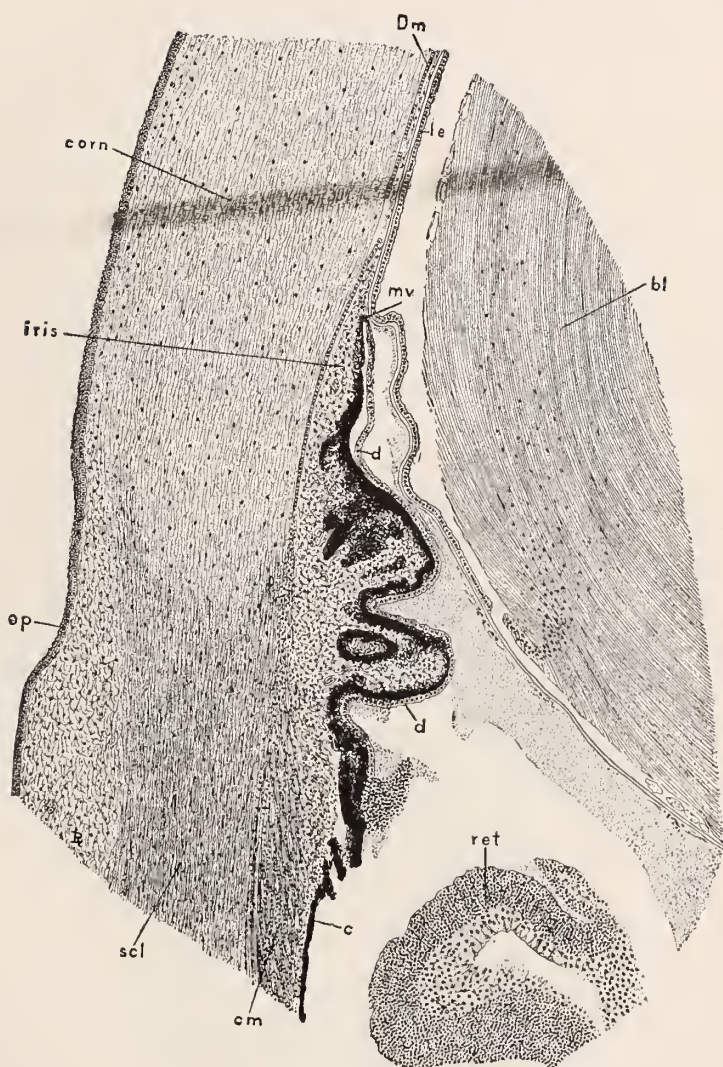


Fig.18.

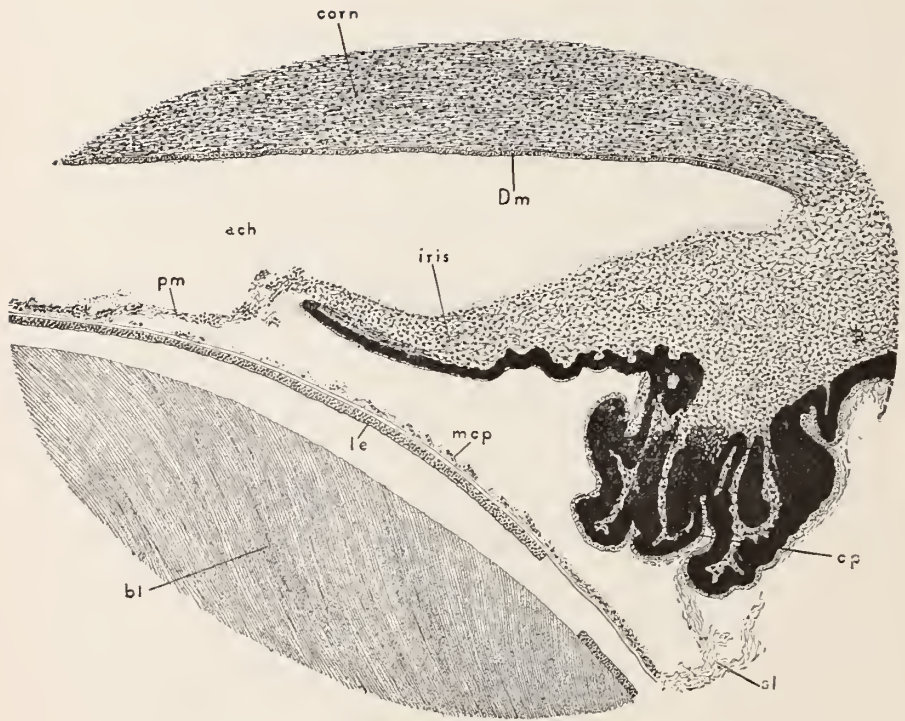


Fig. 19.

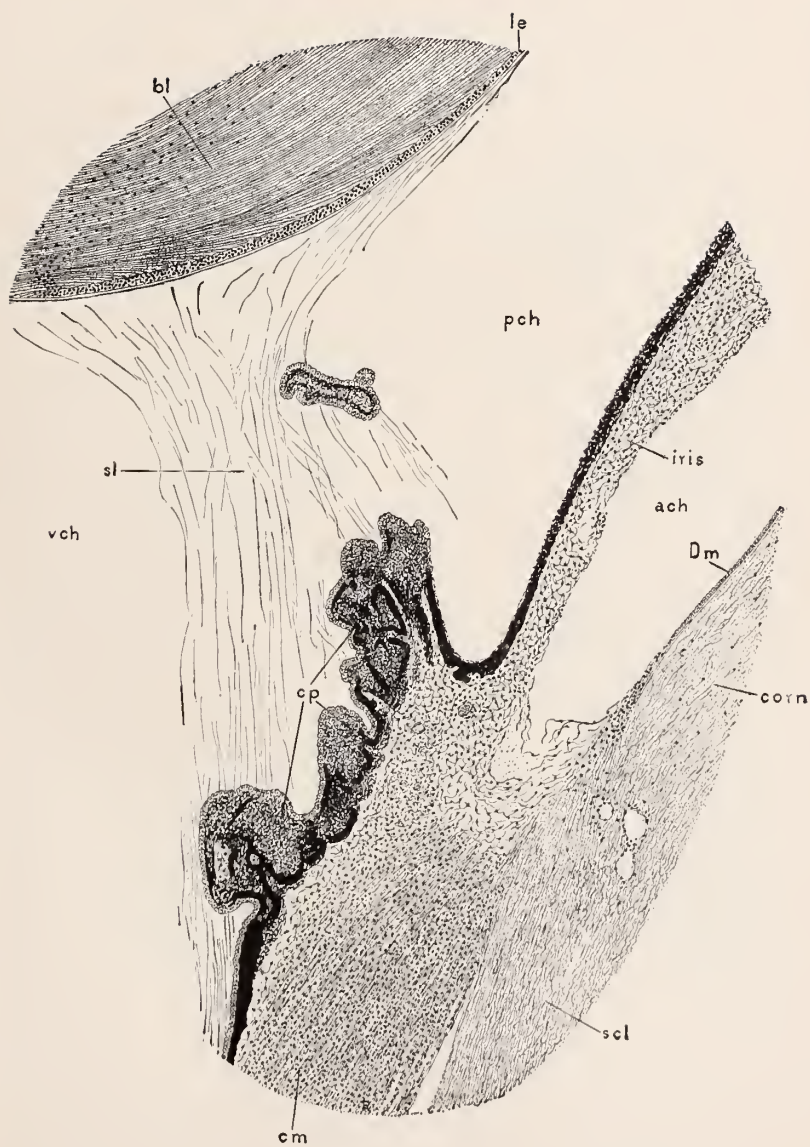


Fig. 23.

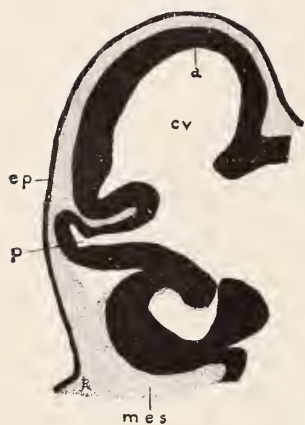


Fig. 24.

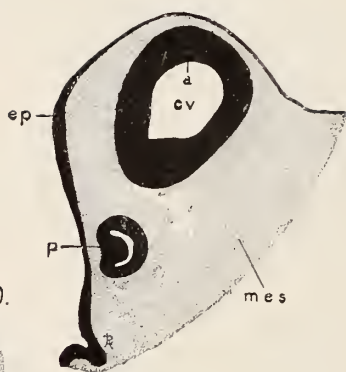


Fig. 20.



Fig. 21.



Fig. 25.

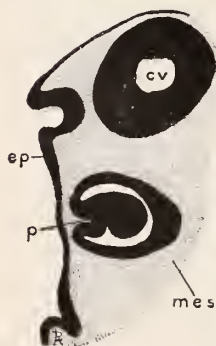


Fig. 22.

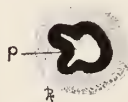


Fig. 26.

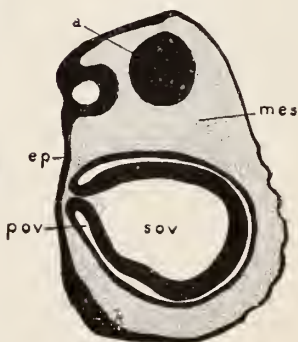


Fig. 28.

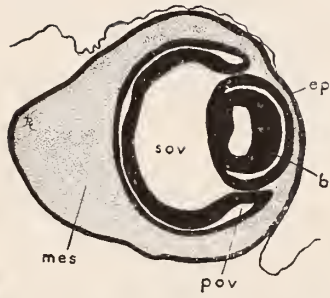


Fig. 27.

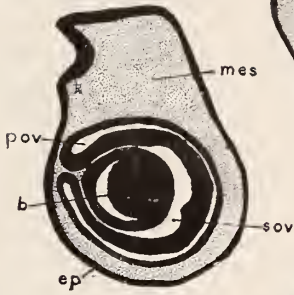


Fig. 30.

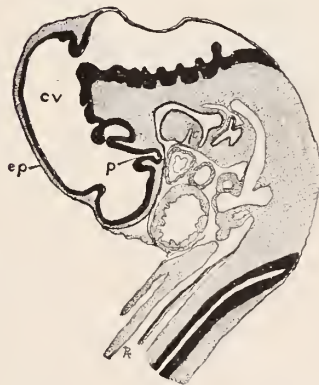


Fig. 29.



Fig. 31.



Fig. 32.

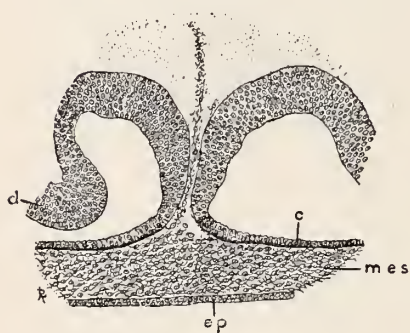


Fig. 33.

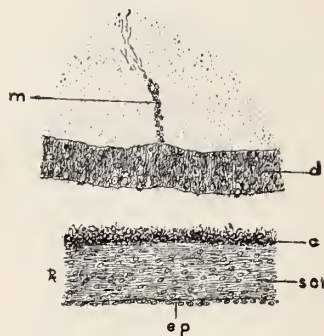


Fig. 34.

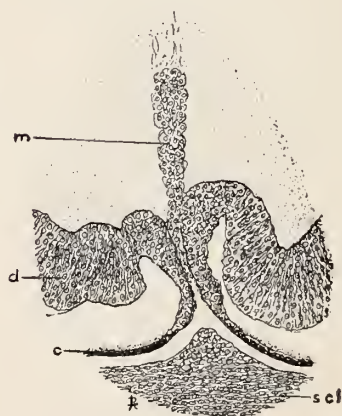


FIG. 14. $\times$ about 53 diam.

Antero-posterior section of eye of embryo calf, 35 mm. long. ep = Superficial epiblast; mes = Mesoblast; sov = Cavity of secondary optic vesicle containing developing vitreous; c = Pigment lamella of secondary optic vesicle, much thinner and more equally pigmented than in previous section; d = Distal lamella of secondary optic vesicle (retina); h = Developing optic nerve; b = Nearly obliterated cavity of lens vesicle; bl = Body of lens, made up of fibres; corn = mesoblastic tissue which has grown in between lens and superficial epiblast to form cornea and pupillary membrane; iris = Iris, developing from mesoblast at margin of cup formed by secondary optic vesicle, where c and d are continuous; g, g = Developing eyelids. In this specimen there is already some condensation of mesoblast around the secondary optic vesicle, indicating the differentiation of sclera and choroid.

FIG. 15. $\times$ about 31 diam.

Antero-posterior section of eye of embryo calf, 38 mm. long. ep = Superficial epiblast, now forming corneal epithelium; c = Pigment lamella of secondary optic vesicle; d = Distal lamella of secondary optic vesicle; h = Optic nerve; ah = Arteria hyaloidea entering eye at nerve and running forward toward lens through vitreous; v = Mesoblastic tissue forming vitreous and filling cavity of secondary optic vesicle; g, g = Eyelids; b = Cavity of original lens vesicle; bl = Body of lens; corn = Cornea; iris = Developing iris, from the inner margin of which the pupillary membrane may be traced along the front of lens for a short distance. The ocular muscles are already indicated in the mesoblast around the eye.

FIG. 16. $\times$ about 31 diam.

Antero-posterior section of eye of embryo calf, 52 mm. long. e = Proximal lamella of secondary optic vesicle (retinal pigment layer); d = Distal lamella of secondary optic vesicle (retina); h = Optic nerve; ah = Central artery of retina, continuous with hyaloid artery; g, g = Eyelids, which have now closed in front of eye; op, op = Beginning of orbicular palpebrarum muscle; m, m, m = Straight and oblique muscles commencing to develop in mesoblast; corn = Cornea; iris = Iris on either side; pm = Pupillary membrane connecting irides; ach = Anterior chamber; bl = Body of lens; scl = Developing sclera. Between scl and c may be seen transverse and oblique sections of blood vessels which belong to the rudimentary choroid.

FIG. 17. $\times$ about 57 diam.

Ciliary region of human embryo, $4\frac{1}{2}$ months. Dm = Descemet's membrane; le = Lens epithelium, in front of which is a clear layer of lens capsule, separated from Dm by a small amount of vascular mesoblast, the pupillary membrane; bl = Body of lens; corn = Cornea; iris = Iris; mv = Anterior margin of secondary optic vesicle, thinning out and growing behind iris to form its pigment layer; d, d = Distal lamella of secondary optic vesicle, reduced to a single layer of epithelial cells covering ciliary processes. Its anterior part near mv contains pigment, and the outlines of the cells are here lost. ret = Retina developed from distal lamella of secondary optic vesicle. It has become torn away from d during the preparation of the specimen. c = Pigment lamella of secondary optic vesicle; cn = Ciliary muscle; scl = Sclera; ep = Epiblast, now forming corneal and conjunctival epithelium. In the retina there is a certain differentiation into layers, and Mueller's fibres are in places quite distinct.

FIG. 18. $\times$ about 57 diam.

Iris and pupillary membrane of calf embryo (head 5 cm. long $\times$ 7 $\frac{1}{4}$ cm. high). corn = Cornea; Dm = Descemet's membrane; ach = Anterior chamber; iris

Iris; pm = Pupillary membrane; mcp = Membrana capsulo-pupillaris; le = Epithelium of lens; cp = Ciliary process; sl = Suspensory ligament.

FIG. 19. $\times$ about 57 diam.

Ciliary region of new-born child. ach = Anterior chamber; pch = Posterior chamber; vch = Vitreous chamber; le = Epithelium of lens; bl = Body of lens; sl = Suspensory ligament of lens; cp = Ciliary process; cm = Ciliary muscle; iris = Iris; Dm = Descemet's membrane; corn = Cornea; scl = Sclera.

FIGS. 20, 21, 22. $\times$ about 35 diam.

Transverse sections of pedicle of optic vesicle, in which later the optic nerve fibres develop. p = Pedicle of optic vesicle. (Fig. 20 = close to cerebral vesicle; Fig. 21 = showing beginning involution by which secondary optic vesicle is formed; Fig. 22 = section close to optic vesicle.)

FIGS. 23, 24, 25. $\times$ about 35 diam.

Transverse sections of pedicle of secondary optic vesicle from chick of 80 hours. ep = Superficial epiblast; mes = Mesoblast; cv = Cavity of cerebral vesicle; a = Wall of cerebral vesicle. Fig. 23 is a cut through cerebral vesicle (cv) showing its connection with pedicle of optic vesicle (p). In Fig. 24, p = Involted pedicle of optic vesicle. In Fig. 25, p = Pedicle close to optic vesicle.

FIG. 26. $\times$ about 35 diam.

Transverse section of secondary optic vesicle from chick of 80 hours. pov = Cavity of primary optic vesicle; sov = Cavity of secondary optic vesicle. Other lettering as in preceding figures.

FIG. 27. $\times$ about 35 diam.

Transverse vertical section of anterior part of eye of embryo chick, 80 hours. mes = Mesoblast; pov = Cavity of primary optic vesicle; sov = Cavity of secondary optic vesicle; b = Transverse section of developing lens; ep = Superficial epiblast.

FIG. 28. $\times$ about 35 diam.

Transverse section of anterior part of eye of embryo chick (92 hours), showing lens vesicle filling anterior part of foetal fissure. ep = Superficial epiblast; pov = Cavity of primary optic vesicle; sov = Cavity of secondary optic vesicle; mes = Mesoblast; b = Developing lens.

FIG. 29. $\times$ about 35 diam.

Transverse section of developing secondary optic vesicle of chick, 68 hours. b = Involution of ep to form lens; ep = Superficial epiblast; pov = Cavity of primary optic vesicle; mes = Mesoblast.

FIG. 30. $\times$ about 20 diam.

Antero-posterior section of head of embryo chick, 80 hours. cv = Cavity of cerebral vesicles; ep = Superficial epiblast; p = Connection between cv and pedicle of optic vesicle. This part is drawn on a larger scale in Fig. 23.

FIG. 31. $\times$ about 96 diam.

Transverse section of foetal fissure in chick of 80 hours. ep = Superficial epiblast; mes = Mesoblast; c = Proximal lamella of secondary optic vesicle; d = Distal lamella of secondary optic vesicle.

FIG. 32. $\times$ about 96 diam.

Transverse section of foetal fissure in chick of 156 hours. Lettering as in preceding figure.

FIGS. 33, 34. $\times$ about 96 diam.

Transverse section of foetal fissure in chick of 186 hours. m = Pecten; scl = Sclera. Other lettering as in Fig. 31. Fig. 33 is from the anterior, Fig. 34 from the posterior part of the fissure.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

CRYSTAL BROOK FARM—A SUMMER HOME FOR SICK CHILDREN.

The charitable disposition of the people of Brooklyn is in no way better shown than by a reference to the ample provision which has been made for the care of its sick poor, so much so, indeed, as to have led some critics to question the wisdom of much of the provided charity, on the ground that it tends to pauperize the community, supplying for nothing medical aid to those who are much more able to pay for it than are the physicians to render it. Whatever may be the truth of the matter so far as dispensaries and hospitals are concerned, we have never heard questioned the great value of summer-homes for sick children. The Sea-Side Home at Coney Island has a record of which any institution might well be proud; the number of lives which it has saved will never be known. Another enterprise in the same direction has, we are informed, been inaugurated by the Diet Dispensary, by which the advantages of a sojourn at the sea-side near Long Branch are to be made available to the poor of the city.

While the attention of the philanthropic has naturally and rightly been directed to such provision for the poor, the needs of families of moderate means and those in affluent circumstances have been entirely overlooked, and when sickness of a nature to be benefited by sea-air appears in such households there is no place to which the little patients can be taken for the desired change. The hotels will not receive them, unless it be at rates which they can ill afford to pay; and even if means are ample, the necessary care, attention and quiet cannot be obtained; and the Homes for the poor will not take them, because they are not poor. Those who have been in charge of sea-side homes have long been cognizant of this want, and no one more so than Dr. Jerome Walker of this city, who for many years did efficient service in connection with the Sea-Side Home of Brooklyn. Thoroughly appreciating the necessity for a place to which children of the well-to-do and the rich could be taken, and where they would be constantly under the eye of an experienced physician, and have the skilful attendance of trained nurses and such food as their condition demands,

Dr. Walker, with the sympathy and co-operation of the medical profession, opened a year ago Crystal Brook Farm. This farm is situated at Mt. Sinai, L. I., fifty-eight miles from Brooklyn, and consists of one hundred and forty acres, forty of them woodland. In a very attractive and descriptive pamphlet which Dr. Walker has published, and which he will be glad to send to any one, he thus describes the Farm and its attractions.

"Crystal Brook Farm is a quiet, beautiful place facing a bay (Old Man's Harbor) adjoining Long Island Sound, and has a water front of over one-half a mile. The shade is ample, drinking water abundant and excellent.

"There are commodious bathing houses, and the bathing is safe and good. Fresh vegetables, berries, milk and eggs are either furnished from the place or are readily obtained. Good meat and fish will be furnished, and all foods that are necessary for health and strength, and which a good cook can prepare.

"Let it be understood that comfortable rooms, good care, medical supervision, suitable food, bathing facilities, and, when necessary, medicine and trained nurses, will be included in the regular charge. Any physician in good standing may have carried out such plan of treatment as he may desire in any case sent by him. *Of course no case of contagious disease will be admitted*, but convalescents from measles, etc., will be received when there is no danger of infection."

We take great pleasure in being able to call the attention of the profession to such a place as Crystal Brook Farm, for during the coming summer many of them will be glad to know that there is already provided a place to which children sick with cholera infantum or convalescing from disease in its various forms may be sent, and still be under the watchful eye of an experienced physician who will carry out their instructions to the letter.



OBITUARY.

FRANK W. ROCKWELL, M.D.

It becomes our painful duty to announce the death of Frank W. Rockwell, M.D., which occurred unexpectedly at his home, 6 Lafayette Avenue, Brooklyn, April 30th. It has been impossible in the short time allotted us to write such an account of the life of Dr. Rockwell as his standing in the profession demands, and we are reluctantly compelled to defer this duty until another issue. In the meantime we

reproduce resolutions which have been adopted by the Medical and Surgical Staff and Standing Committee of St. John's Hospital, and of the Trustees of St. Mary's Hospital.

RESOLUTIONS OF MEDICAL AND SURGICAL STAFF OF ST. JOHN'S HOSPITAL.

At a meeting of the Medical and Surgical Staff of St. John's Hospital, held at the office of Dr. A. W. Catlin on the evening of May 1st, 1889, called especially to take some action in reference to the death of Dr. Frank W. Rockwell,—after a very full expression of affectionate regard and of the highest appreciation of Dr. Rockwell's excellence in the profession and the great value of his services both to the community and to the public institutions with which he was connected, a committee was appointed to prepare a minute for the records of St. John's Hospital, a copy of which is here given.

Frank W. Rockwell was born in Brooklyn, in the year 1843; he was a son of the Rev. Dr. Edson Rockwell, and receiving a liberal education, he was graduated at Amherst College and afterwards in medicine at the College of Physicians and Surgeons in the City of New York in 1868.

Brooklyn was chosen as the field of his professional labors, and the record is one of extraordinary success. While his manner was gentle and unassuming, his speech was fluent and impressive, his habits of study untiring, and his memory most retentive. A more devoted, painstaking, conscientious and reliable surgeon we have not known; a more facile operator we have not seen.

His early appreciation of the value of antiseptics in surgery led him to prepare most thoroughly for every case, and the uniform success which attended his larger operations is a matter of record and of pride in this institution and elsewhere.

Our personal knowledge of Dr. Rockwell's character and attainments assures us that there is no position of honor in the ranks of the medical profession to which he might not reasonably have aspired. His contributions to medical literature are very interesting and would doubtless have been much more extensive had he not been cut off in the midst of active work. He was a member of the Medical Society of the County of Kings; the Brooklyn Surgical Society; the Brooklyn Pathological Society, and the Mutual Aid Association. His appointment to the position of Attending Surgeon to St. John's Hospital, Attending Surgeon to St. Mary's Hospital and Consulting Surgeon to the Sheltering Arms Nursery brought honor to these institutions as well as to himself. The feeling with which we cherish the memory of Dr. Rockwell is one of abiding affection, and this gives us a hearty sympathy for the stricken wife and the three boys of tender age whom

he so ardently loved. May the Heavenly Father watch over and guide them continually.

J. H. HOBART BURGE, M.D.,
Consulting Surgeon to St. John's Hospital.

H. A. FAIRBAIRN, M.D., *Sec'y.*

An adjourned meeting of the staff of St. John's Hospital was held at Dr. Catlin's office on May 9th, 1889, when it was unanimously resolved that a copy of this minute, signed by the Committee, be sent to the family of Dr. Rockwell and also to the press.

H. A. FAIRBAIRN, M.D.,
Sec'y of the Staff of St. John's Hospital.

ACTION OF THE STANDING COMMITTEE ON THE DEATH OF FRANK

W. ROCKWELL, M.D.

At a meeting of the Standing Committee, held at St. John's Hospital, May 6th, 1889, on motion it was unanimously

Resolved, That a special committee be appointed to give suitable expression of the deep sorrow of this committee at the recent sudden demise of our first surgeon, FRANK W. ROCKWELL, M.D. That the same be published in the Brooklyn papers, and a copy be handsomely engrossed and presented to the family of the deceased.

In pursuance of the foregoing the undersigned committee would respectfully present the following minute :

While bowing with due submission to the divine will even in this sad and startling dispensation, we feel we could not too strongly emphasize the sense of grief that the death of Dr. Rockwell has produced in the breast of each member of the Standing Committee, and also in that of the entire household of the hospital.

For fully fifteen years Dr. Rockwell, in his regular course of service, had come as a boon and savior to the sick and stricken, and went out under their regret and benediction.

His skill as a surgeon and his distinguished success in practice, while shedding honor on our institution, had borne him to the front rank in his profession and secured for him a wide and distinguished clinic.

Dr. Rockwell's friendship for St. John's has been ever warm and true, and his sympathy for the Sisters in their arduous work has been to them a constant comfort and support.

This great bereavement, coming so soon after the death of his colleague, Dr. John N. Freeman, produces a double breach in our surgical staff as calamitous as it is strange.

It was not alone for his professional eminence that Dr. Rockwell was honored and respected, but as well also for the love of his wide circle of acquaintance secured by every characteristic of the true Christian gentleman.

While it is felt that Dr. Rockwell's late place on our staff cannot easily be supplied, the loss to the community at large is widely felt and publicly recognized.

To the widow and household which have been darkened by the pall of this sudden and unexpected bereavement, the committee extend their unfeigned condolence

and sympathy, suggesting to them their honored husband and father's precious memory and consistent example as a rich and abiding legacy, and invoke on them in this their day of sorrow God's comfort, support, guidance and blessing.

BROOKLYN, May 8, 1889.

W. H. FLEEMAN, } *Special*
WILLIAM WALLACE, M.D., } *Committee.*

RESOLUTIONS OF TRUSTEES OF ST. MARY'S HOSPITAL.

At a special meeting of the Trustees of St. Mary's Hospital, held May 7th, the following preamble and resolutions were unanimously adopted :

Whereas, We have heard with profound regret of the sudden demise of Dr. FRANK W. ROCKWELL, a most zealous and able member of our hospital staff, and whose untiring efforts and acknowledged professional skill in the special department of which he was chief have contributed largely toward the efficiency and wide reputation of our institution ; and

Whereas, By the death of Dr. Rockwell, St. Mary's Hospital, which has been the recipient of his valued services since its organization, has sustained a grievous loss ; the profession, of which he was a distinguished member, a high-minded, skillful and conscientious surgeon, and the community at large a benefactor ; therefore be it

Resolved, That, while respectfully testifying to his honorable record and unostentatious labors in the cause of suffering humanity, we deeply sympathize with his bereaved family and respectfully tender them our sincere condolence.

Resolved, That the foregoing be incorporated in our minutes, and a duly authenticated copy thereof be forwarded to his family.

(Signed)

JOHN BYRNE, M.D., }
JOHN J. KIERNAN, } *Committee.*
JAMES CLYNE, }

JEROME HENRY KIDDER, M. D.

Jerome Henry Kidder, M. D., formerly a member of the Medical Society of the County of Kings, died at Washington, D. C., April 8th, aged fifty years. He was a native of Maryland, a graduate of Harvard University in 1862, and M.D. at the University of Maryland in 1866. He entered the navy in 1866, and became full surgeon ten years later. About six years ago he resigned his commission and became an official in the Smithsonian Institute, and there continued until the time of his death.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

The regular monthly meeting of the Medical Society of the County of Kings was held at the rooms of the Society, 356 Bridge Street, April 16, 1889.

The Vice-President, Dr. Isaac Barber, in the chair.

There were about sixty-five members present.

The minutes of the March meeting were read and approved.

The Council reported favorably upon the propositions of Drs. L. W. Pearson, Eugene F. Pearce, J. H. E. Sands, Victor A. Robertson, H. L. Grover, S. G. Clark, Jeremiah Koehl, and Robt. A. Black, and recommended that they be admitted to membership.

The following, having been regularly proposed and recommended by the Council, were declared elected members of the Society: Drs. D. W. Waugh, Otto E. F. Risch, Hubert Arrowsmith, Geo. H. Parshall and W. F. Gardner.

The names of Drs. Harry Kent Bell, 113a Second Place, L. I. C. H., 1884, and Henry B. Delatour, 867 Union Street, Coll. Phys. and Surgeons, N. Y., 1887, were proposed for membership, the former by Dr. J. M. Peacock, endorsed by Dr. Chase; the latter by Dr. A. Ross Matheson, endorsed by Dr. Maddren.

SCIENTIFIC BUSINESS.

The paper of the evening, entitled "The disposal of the dead," was read by Dr. J. M. Peacock, and discussed by Drs. A. N. Bell, John G. Johnson, George W. Brush, John Griffin, Joseph H. Raymond and E. F. Smith.

There being no further business, on motion, the meeting adjourned.

W. M. HUTCHINSON,
Secretary.

PROGRESS IN MEDICINE.

OBSTETRICS.

BY CHARLES JEWETT, M.D.,

Professor of Obstetrics and Diseases of Children, and Visiting Obstetrician Long Island College Hospital; Physician-in-Chief to the Department of Diseases of Children, St. Mary's Hospital, Brooklyn.

PORRO OPERATION FOR CANCER OF THE UTERUS.

Beaucamst (*Cent. f. Gyn.*, No. 52,) reports a successful operation with delivery of twins, one of which was dead and macerated. The case illustrates the practicability of Frank's method of treating the stump. The edges of the stump were sutured with silver wire. The sutures, which were left long, were then passed down through the cervical canal into the vagina. The cervix was thus easily inverted and subsequently sutured through and through. This method undoubtedly has advantages over the usual one of stitching the stump in the lower angle of the abdominal wound. Its only disadvantage is a more complicated technique.

A PLEA FOR THE TREATMENT OF PUERPERAL ENDOMETRITIS BY MEANS OF THE CURETTE.

Dr. E. H. Grandin (*N. Y. Med. Jour.*, Feb. 16, 1889,) pleads the claims of the curette to more frequent use in this so often the primary stage of puerperal septicæmia.

By way of preface he alludes to the relatively slow progress of the obstetric in comparison with the gynæcic art, and hints at the mischievous influence of the term meddlesome midwifery. The septic endometrium is comparable to a sloughing surgical wound from which the slough has partially separated. The necrotic material should be removed in the one case as in the other. For this purpose in the puerperal case the intra-uterine douche is frequently more or less ineffectual. Moreover with the antiseptics most in vogue there are toxic dangers in repeated douching.

Dr. Grandin's plan is as follows: In case of fœtid lochia a vaginal douche is administered plain or antiseptic. The fœtor reappearing in a few hours, the cavity of the uterus is irrigated in like manner. If the fœtor again reappears after a few hours the endometrium is thoroughly scraped with the curette and the loose debris remaining

washed out with the aid of the douche tube. For administering the douche the lateral position will be found more convenient than the dorsal as practised by Dr. G. The curetting should be preceded as well as followed by irrigation preferably with an antiseptic solution. The curette for this purpose should be a large one, having a diameter of nearly or quite an inch. Thirty grains of iodoform or iodol may be deposited in the uterus at the close of the operation. It may be added that curetting in the first few days after labor is rarely painful. For prophylaxis the writer lays stress upon the complete evacuation of the uterus at the close of the labor even though the curette be necessary to that end.

HERNIA OF THE PREGNANT UTERUS.

Adams (*Am. Jour. Obstet.*, March, 1889,) has searched the literature of obstetrics for the statistics of hysterocele gravidarum. He collates ten cases of hernia of the uterus through the inguinal canal, one crural, four umbilical and eight ventral hernias. In the inguinal variety Cæsarean section was performed six times, Porro's operation once, induction of premature labor once and spontaneous delivery occurred once. Cæsarean section was also done in the case of crural hernia. Support and forceps sufficed for delivery in the umbilical and ventral varieties.

PUERPERAL ALBUMINURIA.

Lautos (*Arch. f. Gyn.*, B. 33, H. 3,) gives the following statistics of puerperal albuminuria and eclampsia. Of 70 pregnant women examined in the wards of Prof. Kezmarsky at Buda-Pesth, more than 18 per cent. had albumen in their urine. The urine was found to be albuminous in 60 per cent. of recently delivered women. Albuminuria occurs more frequently in primiparæ than in multiparæ in the proportion of 7 to 5. The proportion was lower in premature labors and abortions than in term deliveries. In 39 cases after death from other causes than eclampsia or nephritis, the kidneys were found very anæmic in 15, pale in 21, and full of blood in 3 only. In the cases dead from nephritic causes the following forms of nephritis were found: acute parenchymatous in 2; acute hæmorrhagic in 1; parenchymatous degeneration in 9; and albuminous degeneration in 4.

Dr. L. believes, therefore, that albuminuria is common in pregnant and puerperal women even in the absence of nephritis. Puerperal eclampsia he has observed 53 times in 14,815 labors, with 15 deaths, a mortality of over 28 per cent. Changes in the brain were constantly found after death by eclampsia. He agrees with Osthoff in referring the eclamptic attack to violent reflex vaso-motor disturbance.

VESICULAR MOLE.

Dr. Moore Madden (Br. Gyn. Jour., March, 1888,) in a paper read before the Royal Academy of Medicine in Ireland, presented the following views with reference to the vesicular mole. Vesicular disease of the placenta consists in myxomatous degeneration and abnormal development of the placental chorionic villi, either as a consequence or cause of foetal death.

The symptoms differ little from those of normal gestation. If in addition to the usual signs denoting the death of the foetus the patient experiences occasional gushes of water together with slight hæmorrhage from the uterus lasting for a short time and recurring at irregular intervals vesicular disease should be suspected. While the disease cannot be arrested, measures for the improvement of the general health may do much to prevent a recurrence. The writer believes that interference should not be the rule of practice in all cases. There may be enough healthy placental tissue to maintain the nutrition of the foetus, or the case may be one of twin pregnancy, one placenta being entirely normal.

THE BACTERIOLOGY OF SCARLET FEVER.

(Br. Med. Jour., Feb. 9, 1889.) This article is an editorial review of some recent contributions to our knowledge of this subject. The question is of interest to the obstetrician as bearing upon the possible ætiological relation of the scarlatina poison to childbed fever. Dr. M. A. Raskina has made important researches in this field in the laboratory of Prof. M. I. Afanasieff in St. Petersburg. The malignant complications of scarlet fever, such as lymphadenitis and suppuration of the submaxillary lymphatic glands, phlegmonous inflammation of cervical cellular tissue, aural inflammation, suppurative arthritis and pyæmia were found to be due to a secondary infection of the patient's system with a streptococcus, and it was believed that even diphtheria and serous synovitis, complicating the course of scarlatina, have the same origin. In aural complications the staphylococcus aureus and albus, and in pyæmia the micrococcus pyogenes tenuis sometimes played a pathogenetic part.

Dr. Raskina believes that the streptococci invade the system through the fauces, spreading along the lymphatic tracts. They have no causative relation to the scarlet fever itself, never being found in uncomplicated cases. They have to do only with the above mentioned and similar complications. The streptococci found did not present any morphological or biological features which essentially differed from those of the streptococci occurring in erysipelas, pyæmia and suppurations.

These results, which are to some extent in accord with the observations of Crookshank, serve to emphasize the importance of a disinfectant treatment of the mouth and fauces in scarlatinous patients. For our purpose they are of interest since they go to establish the possible ætiological relation of the malignant scarlatinal complications to puerperal fever. In the light of recent observations the poison of uncomplicated scarlet fever is probably incapable of generating child-bed septicæmia.

DISINFECTION AND DISINFECTANTS.

The following recommendations of the Committee on Disinfectants of the American Public Health Association for the Destruction of Infectious Material are of interest to obstetricians.

1. Complete destruction by fire.
2. Steam at 221° F. for ten minutes.
3. Boiling in water for thirty minutes.
4. "Chloride of lime" (containing at least 25 per cent. of available chlorine) a 4 per cent. solution.
5. Mercuric bichloride, a solution of 1 in 500.

THE NORMAL POSTURE FOR A PARTURIENT WOMAN.

King (*Am. Jour. Obstet.*, April, 1889,) discusses this question at length with a critical review of the opinions and practice of authorities.

His conclusions are as follows ;

1. There is no posture that can be normal for the parturient woman.
2. The continued maintenance of one posture wastes and exhausts the forces of labor, interferes with the normal mechanism, and adds to the duration and intensity of the woman's suffering.
3. Exactly opposite results are produced by proper changes of posture.
4. The indications for change are instinctive desire for it, arrest of the mechanism of labor, emotional discontent, peevishness and despair.
5. The normal mechanism of labor being at present imperfectly understood, and the influence of different postures upon the mechanism, during the several stages of the several positions, of the several presentations being unknown, the selection of given postures for given conditions cannot be defined without further study.

MISSED LABOR.

Goth (*Arch. f. Gyn.*) reports a case of missed labor due to an injury of the uterus caused by a fall at about the seventh month of pregnancy. The child died immediately after the fall. Peritonitis supervened, lasting for six weeks. There were no signs of labor until

after the ninth month, when the liquor amnii escaped after an hour's pain. Weeks then elapsed with no expulsive pains. Offensive discharges persisted from this time and the patient became profoundly septic. The first foetal bone was expelled about four months after term. Attempts at evacuation of the uterus failed owing to the impaction of a cranial bone in the lower segment of the uterus. Several bones were discharged by a utero-rectal fistula. Fourteen months after term the uterus was emptied after splitting the cervix to the vaginal vault bilaterally. Rapid recovery followed.

Goth attributes this rare phenomenon to morbid changes in the musculature of the uterus whereby it becomes incapable of its physiological office. These changes may be inflammatory as in the case reported or they may be neoplastic.

STATISTICS OF THE PORRO CÆSAREAN OPERATION.

Dr. R. P. Harris (*Br. Med. Jour.*, March 30, 1889,) collates two hundred and fifty operations in fifteen countries, with one hundred and fifteen deaths, the total available record thus far (1876-1888).

It is a noteworthy fact that while there were 29 deaths in the first 50 cases, in the last 50 there were but 9; 81 operations have been reported since January 11, 1885, with 16 deaths and 1 suicide in an improving patient. The last 14 operations of 1888 saved all of the women and children but 1 each. It is expected that this record will be augmented by researches still in progress the result of which will be published when complete.

The operations are credited as follows :

<i>Countries.</i>	<i>Cases.</i>	<i>Women Recovered.</i>
Italy	85	43
Austria	61	42
Germany.	41	21
France	17	6
England.	12	5
Russia	7	5
United States ..	7	2
Belgium	5	3
Switzerland	4	3
Scotland	4	0
Holland	2	1
Australia.	2	2
Spain	1	0
Mexico	1	0
Japan	1	1

Breisky of Vienna and his two assistants have together operated 11 times with no death of mother or child. Porro of Milan (formerly of Pavia) has done 6 operations with only 1 death. The lowest mortality has been found in elective operations and in hospitals either before the full period of gestation was complete or immediately after the onset of labor. Dr. Harris says that his researches have not led him to hope

for a recovery of 95 per cent. as thought possible by Mr. Tait, but they have given encouragement to believe in a possibility of 80 to 85 per cent. in very careful hands. As the Saenger Cæsarean operation has saved 66 out of 78 women in Germany, he sees no reason why the Porro method under the same degree of care cannot accomplish like results.

MANUAL CONVERSION OF FACE AND OCCIPITO-POSTERIOR INTO OCCIPITO-ANTERIOR POSITIONS.

Loviot (Nouv. Arch. d'Obstet. et de Gyn., Mars, 1889,) advocates the manual conversion of face into vertex presentation in difficult face cases. He ruptures the membranes and hooks down the occiput by means of the hand in the uterus, under chloroform. Rapid delivery is then effected by the forceps.

Troublesome cases of occipito-posterior position are likewise treated by manual interference. With the hand in the vagina, the four fingers are placed behind the occipital pole, the thumb against the anterior temple; the occiput is thus rotated to the front during a pain. Application of the forceps before releasing the head from the grasp of the hand is sometimes necessary to prevent recurrence of the mal-position. It goes without saying that asepsis is a *sine qua non* in these procedures and makes scientific practice of what in preantiseptic days would have been termed meddling.

INDUCTION OF PREMATURE LABOR BY MEANS OF IODOFORM TAMPONS.

E. Chennevière (Nouv. Arch. d'Obstet et de Gyn., Mars, 1889,) cites three cases in which he induced premature labor by the use of iodoform tampons in the cervix and inferior segment of the uterus after the method of Vulliet.

THE MECHANISM OF PLACENTAL SEPARATION.

Hart (Ed. Med. Jour., April, 1889,) restates his views of the mechanism of the third stage of labor and reinforces them by showing that they apply in anomalous as well as ordinary cases. Hart's theory it will be remembered refers the separation of the placenta to the expansion of the placental site during the intervals between the pains. He holds that the placenta does not separate by reason of diminution of area of the placental seat. The placental site increases slightly as the pain dies off and the separation occurs because the placenta cannot respond to this after its foetal and intervillous circulation are cut off.

Cases of twins, such as are recorded by Denman, in which the placenta of the first child is expelled (without hæmorrhage) before the birth of the second child, go to sustain the theory. A diminution of placental area to 4 by 4 inches is in such cases impossible, but a dis-

proportion between the placental area and the placental site does occur and hence the separation in accordance with his views. Cases in which the second child is putrid, yet its placenta is not separated till after the expulsion of the first are not so satisfactorily explained by Hart's theory. A case of single birth reported by Münchmeyer, and similar ones in which the placenta was expelled before the child the writer explains as follows: The child having died the foetal circulation is cut off; the intervillous circulation is diminished by uterine retraction and thus we have the placenta prevented from following up the expansion of its site after the pain dies off. The theory of separation by extreme contraction of the placental site clearly cannot hold in such cases. Most obstetricians will prefer to take refuge in a simpler mechanism than the ingenious theory of Hart.

BOOK NOTICES.

THE OPERATIONS OF SURGERY; A SYSTEMATIC HANDBOOK FOR PRACTITIONERS, STUDENTS, AND HOSPITAL SURGEONS. By W. H. A. Jacobson, F.R.C.S. With 119 illustrations. Philadelphia: P. Blakiston, Son & Co., 1889. Pp. 1009. Price, \$5.00

This volume is the outcome of a strong belief, which the author has held for many years, that a work on operative surgery which aimed at being more comprehensive in scope and fuller in detail than those already published, would be of service to practitioners and students.

It would be impossible in the space allotted us to give any adequate idea of the excellent features of this book. The descriptions of the operations are very clear and concise, and the illustrations well adapted to make the descriptions still more intelligible than any mere words can do. The paper and the type are of the best. It does not express the high esteem with which we regard this volume, to say that it is the best work of the kind that we have seen, as we know no book with which it can be compared. Perhaps the best criticism of it is to say that the author has succeeded in what he undertook, to produce a work which was more comprehensive in scope and fuller in detail than any hitherto published on operative surgery.

It is a book which every surgeon should not only have in his library, but one without which he can hardly do justice to his patients.

OSTEOTOMY FOR ANTERIOR CURVES OF THE LEG. By De Forest Willard, M.D. Read before the Am. Orthopædic Society at Washington, September, 1888. 8vo pamph., pp. 20, illus. Reprint from Med. and Surg. Reporter, January 19, 1889.

THE ELECTROLYTIC DECOMPOSITION OF ORGANIC TISSUES. By Geo. H. Rohé, M.D. 12mo pamph., pp. 15. Reprint from N. Y. Med. Jour., December 1, 1888.

BROOKLYN VITAL STATISTICS FOR FEBRUARY 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Data of Comparison :

Population, estimated January 1, 1889.	814,505	The number of Births reported was ..	1026
Inhabited houses, about.	94,000	The number of Marriages reported was ..	358
In the month of February there were 1422 deaths, the rate of mortality being 22.76 per 1000 of population.		The number of Still-births reported was ..	106

The mortality by classes and by certain of the more important diseases was as follows :

Causes :

1. Zymot	320	Malarial Diseases.	7
2. Constitutional	228	Diarrhœal Diseases (all ages).....	7
3. Local.	720	“ “ (under 5 years) ..	5
4. Developmental	116	Phthisis	153
5. Violence.....	38	Bronchitis.	89
Measles	34	Pneumonia.	184
Croup.....	43	All Respiratory.....	291
Diphtheria.....	113	Bright's Diseases	30
Scarlet Fever.....	36	Puerperal Diseases.	10
Typhoid Fever.....	5	Old Age.....	35
Whooping Cough.....	39	Suicide	5

Reported Cases :

Diphtheria	286	Measles	105
Scarlet Fever.....	348	Typhoid Fever.....	12

Deaths by sex, color, and social condition were as follows :

Male.....	738	Foreign	408
Female.	684	Married.....	342
White	1400	Single.....	877
Colored.....	22	Widows, Widowers, and not stated ..	203
Native	1014		

Still-births, excluded from list of deaths, were as follows :

Males	56	} Total.....	106
Females	50		
Deaths in public institutions	86	Homicides	
Deaths in tenement houses	672	Suic.des.....	5
Inquest cases			122

Age periods :

Deaths under 1 year.....	296	Total deaths 5 to 20	117
Deaths under 5 years.....	335	“ “ 20 to 40.....	237
Total deaths under 5 years.....	631	“ “ 40 to 60	221
		“ “ 60 and upwards.....	216

Certain foreign and American cities show the following death-rates for the month of February, 1889:

Brooklyn	22.76	Vienna	22.75
New York.....	27.24	Paris	24.09
Philadelphia	19.93	London	19.22
Berlin.....	23.25	Glasgow.....	26.05
Dublin.....			27.52

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 7.

BROOKLYN, N. Y., JULY, 1889.

WHOLE No. 19.

ORIGINAL ARTICLES.

REPORT OF A CASE OF PRIMARY CANCER OF THE PANCREAS.

By GEO. McNAUGHTON, M.D.,

Read before the Medical Society of the County of Kings, March 19th, 1889.

The infrequency of cancer involving the pancreas primarily, and the difficulties which one meets with in diagnosing diseases of this organ would seem to warrant the presentation of the following history.

This patient was seen and examined by as many as a dozen physicians, some of whom enjoy more than a national reputation, yet all failed to make an early diagnosis. The most eminent of the consultants did not think the pancreas was diseased in any way.

It may be of interest to mention some of the diagnoses that were made, viz.: Gastralgia; perverted condition of the nervous system due to the use of stimulants and narcotics; angina pectoris; circumscribed peritonitis; fæcal accumulation; dilated stomach with possibly an ulcerated condition of the mucous membrane of that organ; tubercular peritonitis, etc., etc. Each of the various opinions had a fair basis, and each could be well defended by argument. These facts are mentioned to show how difficult it must have been to come to a correct conclusion.

The difficulties attending a diagnosis of a diseased pancreas will be evident when we consider the small size of the organ, its peculiar functions, its non-sensitiveness, and its location, so deep in the abdominal cavity, and the sensitiveness of the surrounding tissues and organs; bearing in mind these facts, a physician should not be censured if he fails to make an early diagnosis of a disease of the pancreas.

My patient, who had cancer of the pancreas, was a native of Scotland, thirty-five years old. She had always enjoyed good health before her last sickness. She possessed a high-strung nervous organization; capabilities, both mental and physical, above the average. The exact date of her first symptoms I could not ascertain, but it was sometime before October 13, 1888, when she consulted her family physician, Dr. Walter Rae of Jersey City, who informed her that she was suffering from gastralgia, and prescribed accordingly. I was called to see her on December 11, 1888. I did not hesitate to take advantage of the opinion of the three physicians who had preceded me and was inclined to agree with the last, who had pronounced it neuralgia of the heart. She described an attack of what is known as angina pectoris very minutely, and she had the peculiar pulse which is so often found in patients who are suffering from that peculiar affection. I learned that she had been ill many weeks, at least eight, and that she had been gradually failing in strength and flesh. On careful auscultation and percussion, I was unable to make anything out of it. The region above and to the right of the umbilicus was unusually tympanitic; the skin in this particular locality was slightly discolored, as if it had been bruised. She was not willing to stand deep pressure. While inclined to think that she had neuralgia of the heart, I concluded from the condition of things that there was trouble below the diaphragm and believed from the limited sensitiveness that she had a circumscribed peritonitis. The patient was seen on the following day by two other physicians, who were called without my knowledge; they diagnosed a circumscribed peritonitis, and expressed themselves as believing that the tympanites was kept up by the continued use of morphine, which was given under the mistaken idea that she was suffering great pain. They pronounced her an opium eater and were inclined to criticise the physician who had got her into this habit. Their opinion was communicated to the attending physician, who attempted to reduce the quantity of the anodyne, with results most unsatisfactory. As it was thought there might be an accumulation of feces, inspissated ox-gall, one grain in capsules, was given every hour until twelve had been taken, after which a seidlitz powder. The result of this was a tremendous evacuation. At this time I discovered that the stools contained particles of what appeared to be fatty matter. These peculiar stools

continued for a few days only. The fat was abundant so long as it did continue. The tympanites did not diminish to the extent which we had hoped, and the pain, instead of diminishing, increased very much. She now referred the pain to the back. She said that she felt as if her back was being opened and shut again. This pain was paroxysmal. The patient continued in about the same condition until January 13, 1889. Repeated attempts had been made to reduce the morphine, but without success. After further consultation, an exploratory laparotomy was determined upon. As soon as the patient became anæsthetized, a tumor could be easily outlined. Suspecting this to be a malignant growth, yet not certain, it seemed best to proceed and ascertain if possible the exact condition present. The laparotomy was therefore done. The incision, which was about two and one-half to three inches in length, was made through the linea alba, a little above the umbilicus. The finger was introduced, the mass felt, and the growth believed to be malignant.

Adhesions were so numerous and of such nature as to render further surgical procedure out of the question. The surgical wound healed promptly and without trouble. About the 22d of January icterus developed. Until this time the patient presented no skin manifestations, such as are so often seen in persons suffering from a malignant disease. Now, that all agreed that the patient could not live, and that she really did suffer, morphine was allowed often and in sufficient quantity to make her comfortable.

For several days before her death she was unable to take nourishment, as each attempt was followed by pain, nausea and hiccoughing. The last symptom was persistent and very annoying.

Rectal injections containing 20 grains to 3 ss. chloral hyd. were found to be of great service in inducing sleep, of course used in conjunction with morphine. She was enabled to get from four to eight hours continuous sleep at night.

This patient died February 10th. The prominent symptom during her sickness was pain, paroxysmal and neuralgic in character, not fixed, first in region of the stomach, then about the heart, and extending down the left arm to the little and second fingers, then near the umbilicus, and finally, the most excruciating, in the back. She also said that when turning over in her bed she could feel something drag from the back. The occasional symptoms were nausea, vomiting and profuse sweats, tongue red and dry. The condition of the pulse was usually small and feeble; respiration normal, except toward the end, when it became very slow. This was no doubt due to the morphine and the jaundice. Temperature never high, usually 99° to $99\frac{1}{2}^{\circ}$ F.

Physical signs.—Resonance tympanitic over whole of the abdomen;

easily perceptible pulsation over the region above and to the right of the umbilicus.

Auscultation disclosed a murmur (probably obstructive) which continued to be present from the time it was discovered.

Autopsy made by Dr. Wm. Browning, Dr. Rae of Jersey City, Dr. Winfield and myself present; all who had been in attendance during the patient's illness were invited. The body was found to be much emaciated and jaundiced. Abdomen slightly distended, some fluid in peritoneal cavity. Descending colon displaced to the right; transverse colon attached to tissues beneath, muscular tissue of transverse and descending colon atrophied; the wall of that portion of the large intestine very thin; mesentery of small intestine filled with hard nodules.

The tumor was found beneath the stomach and attached to it. The whole of the pancreas was found enveloped in cancerous tissue. Microscopical appearances as observed by Dr. Wm. Browning: "A resemblance of the gland structure is preserved. The representatives of the gland cells are of various sizes and somewhat indefinite in outline. They no longer present any appearance of the normal arrangement. In the part examined they had undergone partial fatty degeneration. Here there was also abundant small cell infiltrations, which also seemed to have penetrated a little the immediately surrounding connective tissue."

It is always satisfactory to find the clinical history borne out by the pathological condition. In this case many of the symptoms were understood only after the post-mortem examination; for instance, the peculiar paroxysmal attacks of pain were doubtless coeliac neuralgia. The murmur heard was probably due to pressure upon the abdominal aorta. The pulsation, which was marked, was no doubt transmitted through the cancerous mass from the same artery.

The persistent tympanites was very likely due to the paralysis of the lower bowel. Some of the symptoms of obstruction were due to the same cause. The reason of the atrophy of the muscles of the transverse and descending colon might have been some interference with the nerve supply, very likely those branches which accompany the deep mesenteric artery. Jaundice was due of course to the obstruction to the common duct. Fatty stools were due to the absence of both bile and pancreatic fluid. Why this was not a constant symptom I cannot understand. In discussing this history and report, the question of the advisability of laparotomy will naturally arise. I believe it was perfectly proper in this case, and regret it was not done earlier; it would have saved the patient much suffering. It may be questioned whether it should have been done after the presence of a tumor (probably malignant) was made out.

This patient suffered no inconvenience from the operation. The aim kept constantly in view in way of treatment was to preserve her nutrition and make her comfortable.

There has been considerable written of late about diseases affecting the pancreas, some of which might have been quoted, but it seemed best to present the history of this case as it has been read. The infrequency of disease of the pancreas leads us perhaps to sometimes forget that there is such an organ, or that it is liable to become the seat of disease.

DISCUSSION.

Dr. HOPKINS.—This paper certainly is an exceedingly interesting one. I have taken pains to look up a great many authorities, and of the older authorities the only one that I found that alludes to primary cancer of the pancreas is Bristow. Such an eminent man as the late Dr. Austin Flint says that it never occurs as a primary disease, and Aitken does not allude to a possibility of such a condition. For that reason we ought to have these cases brought before the Society. If we could have more of these cases brought before us, I think our work for the profession and for science would be of much greater benefit.

Dr. BROWNING—In this case that Dr. McNaughton relates, the symptoms are specially interesting. Pain passing down the left arm is observed in troubles of the heart, spleen and stomach; to which list the pancreas must now be added.

I think the Doctor deserves in connection with that case to be complimented. From the remarks of the gentlemen around at the autopsy, I infer that he made the diagnosis of cancer of the pancreas before the laparotomy. A very recent writer states that that has never been done.

Of course a person may get right by accident, but he seems to have been warranted in his diagnosis.

Dr. SHAW—I saw this patient before Dr. McNaughton saw her, and at that time the patient complained only of pain in the stomach and in the back. She was excessively pallid, and she had the dry red tongue that Dr. McNaughton has described. She was exceedingly emotional and talked incessantly in an extravagant way about herself. She appeared at that time to digest fairly well as far as I was able to make out, but she complained of this peculiar pain, and located it entirely in the region of the stomach and through to the back, as she appears to have done when Dr. McNaughton saw her first. There was none of the symptoms at that time that Dr. McNaughton describes of pain down the arm, and the question of diagnosis came up as I saw her in consultation with another physician who was in attendance. The question of its being a cancer was discussed, but we saw no strong evidence upon which to make such a diagnosis. In

fact there were no symptoms at that time upon which a positive diagnosis could be made. I took the ground that it was probably gastralgic, and I thought that probably she might have been a patient who took liquor quite freely, but in this I may have done her an injustice. She was of a highly nervous organization, and the question of her being a morphine taker came up at that time, but we became satisfied that she was not a person with the morphine habit. Morphine was given her on my recommendation, and I believe that I was justified in doing so. I think that any patient who suffered as she did should have morphine.

I saw the patient a second time about a week or so after, and the symptoms were not at all changed, except diminution of pain. The intense pallidness of the patient, the pain, and the peculiar tongue, red and beefy looking, made me think at that time she had some serious abdominal trouble, but what the nature of it was I was unable to make out; in fact, I saw no symptoms on which I could base any further and more positive diagnosis.

I agree with Dr. Browning thoroughly that Dr. McNaughton deserves credit for having made the diagnosis of cancer of the pancreas before the patient died, but he had this important thing in his favor, that he was able to see this fatty substance he has described which lead to the diagnosis. An examination of the abdomen showed nothing at all to indicate any growth there, and of course when we think of the location of the pancreas, we can readily see why it is impossible for anybody to discover it.

I do not hesitate to speak of the case as having been seen by me, because there are many physicians who saw the patient and who are much more eminent in general medicine than I am, who failed to make a diagnosis.

Dr. RAYMOND.—There is one symptom that Dr. Shaw referred to, namely, the presence of fat in the fæces. If I understand Dr. McNaughton correctly, the fat only showed itself for a few days, and then after that, all that the patient took was peptonized milk. We could hardly expect that with such a diet there would be any perceptible amount of fat in the fæces.

Dr. SHAW.—Was the diet she took nothing but milk?

Dr. McNAUGHTON.—Principally milk.

Dr. SHAW.—She took solid food at the time I saw her.

Dr. McNAUGHTON.—I think the giving of morphine was perfectly proper, and am very sorry that I did not give her larger doses, and regret having made the attempt to stop the use of it, because her suffering was excruciating.

Dr. MADDREN.—Was there jaundice at that time?

Dr. McNAUGHTON.—No, sir.

Dr. MADDREN.—Were any of the other organs except the pancreas examined?

Dr. McNAUGHTON.—I think not microscopically.

NOTE.—The case is of interest from its rarity, and the difficulties of diagnosis; even the impossibility of making a diagnosis, as some authors state, has been pointed out by Dr. Hopkins this evening. Unfortunately the case does not add to our knowledge, even one clinical feature or symptom, which would aid in the future in making a diagnosis of primary cancer of the pancreas.

CASE OF REMARKABLY HIGH TEMPERATURE.

BY JOHN W. WHITNEY, M.D.,

RESIDENT PHYSICIAN,

Service of R. Ormiston, M.D., Visiting Physician.

Extract from Records of Brooklyn Hospital.

William McQ. was admitted April 28, 1885, to the Brooklyn Hospital. The diagnosis made was intermittent fever. His age was forty-eight; United States; widower; merchant.

Two or three months ago patient was treated here for delirium tremens. Soon after leaving hospital he became partially paralyzed, and was taken to the Cumberland Street Hospital. There he developed intermittent fever of the most extraordinary type. Every third day his temperature would go up to 108° F. and 113½° F.

April 29.—His chills last about three-quarters of an hour. His story was not believed until yesterday, when temperature was taken at two different times, and was first 110° F.; second, 113° F.

May 1.—He remained in this condition half an hour. Last night had hard chill; shook the whole ward; temperature 112° F.

May 2.—Temperature 99° this morning. Says he feels sore. During the chill and also the fever that followed, he seemed to be almost delirious; very restless; would kick the bottles out of bed, etc. Pulse was 100; respiration 38.

May 3.—To-night he says he will have another chill; was called at 2 A. M. Very light chill, followed by temperature 112°. The skin does not feel warm above normal. Seems to be quite weak. In bed most of the time, yet not necessarily so.

May 4.—These "hot flashes," as he calls them, occur several times every day, as was ascertained by taking his temperature every half hour for the twenty-four hours. The state of his mind seemed to have

something to do with the flashes, *e. g.*, he became angry at the nurse several times on different occasions, and always had a rise of temperature following it.

TREATMENT.—At first he was given large doses of quinia sulph.; that was followed by Warburg's tincture, $\mathfrak{z}$ i. doses. The treatment he was kept on most of the time was Fowler's sol., $\mathfrak{M}$ iv., t. i. d., hypodermically. His appetite was fairly good; bowels regular most of the time; slept very well. He only had a few chills occurring every other day, but the fever came and went with every change of the wind. He gives a history of intermittent fever, contracted in Georgia ten years ago.

These hot flashes came and went until May 17th. After that he never had any rise. Many times he would complain of feeling chilly, but no marked rigor followed. Following some of these flashes he would complain of pain in his back and head. Often the muscles would twitch on different parts of his body so much, that at times it was impossible to take his pulse. These flashes lasted from five to thirty minutes. He could tell the moment his temperature dropped or went up. Every day's observation seemed to point to a central lesion and not one of fever. Before he came here he was delirious before and during the rise in temperature, but later on he was little disturbed. He was always exceedingly nervous, so much so, that temperature could not be taken by mouth. He was a wreck from the effects of alcohol, both physically and morally; was constantly complaining, and would sulk for days if the nurse reproved him.

Discharged May 24th for insubordination.

A CASE OF PERFORATION OF THE VERMIFORM APPENDIX—GENERAL PERITONITIS.

BY W. J. CRUIKSHANK, M. D.

Read before the Brooklyn Pathological Society, April 11, 1889.

About four o'clock in the afternoon of June 16th, 1887, I was requested to visit a boy thirteen years of age, who, up to that time, had always enjoyed perfect health. He was one of a family of three children, and his parents had always regarded him as being the strongest and most robust person in the family. He was very fond of athletic sports, in all of which he took a very active part, and it was said of him that his physical strength enabled him to outdo any of his companions. His mother stated that the night previous he had retired

feeling in his usual good health and spirits, but that when he appeared at the breakfast table in the morning she noticed that he looked pale. and when she asked how he felt he answered that he was tired, had a headache, and felt a little sick at the stomach. She suggested his remaining home from school, but as he was making preparation for the coming examination he insisted on going. He returned about half-past eleven o'clock, saying that he felt so badly he could not remain. He complained of being tired, and said he felt a little sick at the stomach. He undressed himself and went to bed. At about twelve o'clock he vomited the contents of his stomach, which consisted of partly digested oatmeal and milk which he had eaten in the morning. In half an hour he vomited the second time, the vomited matter being of the same character as before. After this, his mother said, he seemed better but still complained of feeling tired. When I saw him he was in bed. He complained of no pain.

I questioned him very closely as to what he had eaten the day before. He said he had eaten some cherries, but he was positive he had not swallowed any of the pits. His bowels had moved naturally. On careful examination of the abdomen no tenderness was discovered. His pulse, temperature, and respiration were normal, and his tongue clean. I regarded the case as one of acute indigestion, and directed his mother to give him a wineglassful of the solution of citrate of magnesia every hour or two until his bowels moved freely, and, bearing in mind the fact of his having eaten the cherries, expressed a wish to hear from the case the next day. His mother informed me by telephone early the next morning that the citrate of magnesia had moved his bowels freely two or three times, that he had slept well all night, and that he was anxious to get up and go to school. I advised that he remain in bed, and said that I would prefer to see him again before he was allowed to get up. At my next visit, which was Saturday, about four o'clock in the afternoon, his mother informed me that he had appeared better ever since he had taken the magnesia. His appetite had returned, he had eaten quite a good breakfast of toast and milk, and for lunch he had begged her to let him have a poached egg, which he ate with great relish, and complained a great deal because he was not allowed to get up, which request his mother said she would have granted but that she noticed when he got up to go to the bath-room he walked with his body bent over toward the right side and said it hurt him a little to straighten up.

On examination I found his pulse and temperature normal. His bowels had moved once in the morning quite freely, and he complained of no pain except a very little on moving the right lower extremity.

On making gentle pressure over the right iliac region I found marked tenderness. Notwithstanding the normal temperature and pulse, the diagnosis of perityphlitis was made, and a foreign body, probably a cherry-pit in the vermiform appendix, suspected. The patient was cautioned to remain perfectly quiet and under no circumstances to get out of bed. Hot poultices were applied over the right iliac region, and a prescription for an opiate was left with instructions that it should be used in the event of pain. The patient was then left in charge of his mother, who was cautioned as to the gravity of the case and instructed to notify me of the occurrence of any change in his condition before my next visit. That evening, about eleven o'clock, I was hastily summoned to the bedside of my patient, and on my arrival at the house was informed by his mother that he had been perfectly comfortable up to about seven o'clock, when he began to be a little restless and complained of the weight of the poultice. She made a lighter one, but he still complained of its being heavy and earnestly requested her not to apply any more.

She discontinued their use, after which he said he was perfectly comfortable, suffering no pain, but felt a little tired. At his request his mother read to him, and he very shortly went to sleep. He slept soundly until about eleven o'clock, when he awoke suddenly and asked his mother to give him the basin quickly as he was going to vomit. He vomited twice, each time a dark-colored fluid which his mother said looked like blood mixed with milk; but as she had thrown it away before my arrival, I was unable to see it. After vomiting the second time he had quite a severe chill.

I found him almost completely collapsed. His radial pulse was almost imperceptible; the heart's action very rapid, fluttering and irregular; respiration rapid and thoracic, temperature subnormal, countenance very pale, and his body covered with a cold, clammy sweat. His consciousness and senses remained unimpaired, and his mind was perfectly clear.

No time was lost in giving several hypodermic injections of brandy; hot-water bottles were applied to the feet and lower extremities, and as vomiting had ceased and the stomach had become quiet, the administration of stimulants was continued by the mouth until his condition was so far improved and sufficient reaction had taken place as to allow opportunity to examine the abdomen, which was found tender and tympanitic, most marked in the right iliac region.

The patient now assumed a position on his back, with his knees drawn up, countenance anxious, and complained of constantly increasing abdominal pain, which was relieved by a half grain dose of morphine administered hypodermically.

As I had regarded the case as one of perityphlitis of decidedly acute and very recent origin, I was very much surprised at the turn the case had taken, but realized the necessity for considering it with a view to immediate surgical interference; so I sent for my friend, Dr. F. W. Rockwell, and suggested to him the advisability of performing an immediate laparotomy. As the patient was still suffering somewhat from the effects of shock, and as no evidence of the formation of an abscess could be detected by the most careful examination, it was decided to await further developments.

As we had now to deal with an undoubted inflammation of the peritonæum which seemed to be increasing hourly, the opium plan of treatment was decided upon. The patient was brought as rapidly as possible completely under its influence by the use of full doses of morphine given by the mouth and repeated every hour until the respiration was brought down to fourteen per minute. I remained all night and administered all medicine and nourishment.

At three o'clock in the morning of Sunday the 29th, his pulse was 114, temperature 101°, respiration 14. He was free from pain, sleeping soundly but easily aroused, and perfectly clear in mind. Up to this time two grains of morphine had been given and milk punch was being freely administered. At six o'clock A. M. the temperature was 101°, pulse 112, respiration 13; no pain, abdominal tenderness marked on deep pressure, kidneys acting freely, urine quite clear, mind clear, and patient expressed himself as feeling comfortable. Dr. Rockwell saw him again about eleven o'clock, and as his condition was so much improved it was decided to continue the present treatment. At this time his pulse was 114, temperature 101°, respiration 13; his mind was clear and he was sleeping quietly. He remained in about this condition, except that the tympanites had considerably increased, notwithstanding the constant use of turpentine stupes, until the morning of Tuesday the 21st. At that time his pulse began to increase in frequency and lose its good quality, and by noon his pulse was 140 and irregular, and his temperature 102°. Quinine, digitalis, and nux vomica were added to the medicinal treatment with temporary amelioration of the symptoms. Dr. Rockwell saw him again about this time; but as no evidences of an abscess were discovered upon careful examination, it was decided that an operation would not be justifiable. From this time on the evidences of general peritonitis increased, the abdomen became more and more tympanitic, the pulse gradually lost its quality and continued to increase in frequency, the temperature rose to 103° the stomach rejected all nourishment and medicine, and the patient became actively delirious, in which condition he remained for about three hours, after which he passed into a

comatosed condition and died, death occurring about two o'clock A. M., Thursday, after an illness of about seven days.

The autopsy was made by Dr. B. F. Westbrook twenty-four hours after death. The body having been placed on ice, was well preserved. On opening the abdominal cavity, the intestines were found very much distended with gas. The entire peritonæum, both visceral and parietal, was found intensely injected and covered more or less abundantly with recent plastic material, more abundant in the region of the colon. Its cavity, particularly the most depending portion, contained a yellow fluid which seemed to be sero-pus. A perforation of the appendix vermiformis about as large as a three-cent piece, near its cœcal attachment was discovered. A hard-looking body was seen projecting through the perforation, which seemed to close it entirely. The cœcum and appendix were removed and the foreign body examined in situ. It was wedged in the appendix, and presented the appearance of having been crowded in as far as possible and of having become partly encysted. That portion of the appendix which held it was found very much distended, as if to accommodate itself to its new function. The perforation was enlarged by Dr. Westbrook sufficiently to enable us to remove its contents, which proved to be an intestinal concretion.

The history of this case seems to me to be of more than usual interest, owing to the fact of its belonging to a class of cases with which the general practitioner is continually coming in contact. They interest him more particularly because they always occur more or less suddenly, and, as a consequence, he is brought face to face at very short notice with a condition of the utmost gravity.

A hasty glance over the literature of the subject of inflammatory conditions of the appendix vermiformis and its surroundings cannot fail to impress the reader with what frequency they occur. Taft says that in three hundred personal observations every third person between the ages of twenty and seventy showed traces of inflammatory trouble, past or present, in the appendix, and that actual ulceration existed in five per cent. of all bodies examined by him.

In Noyes' "Collection of One Hundred Cases of Perityphlitic Abscess treated by Operation" (Trans. Med. Soc. R. I., December, 1882), it was found by analysis that there were forty cases in which concretions or foreign bodies were found, fourteen cases where much air was met with, forty-five where pus more or less fœtid was evacuated, and one where it was not noted. This proves very clearly the fact of perforation being very common. It is almost impossible to find a medical or surgical journal which has been published during the past two or three years which has not had a greater or less amount of space

devoted to the discussion of this subject, more particularly with reference to the advisability of surgical interference.

Since 1875, when Dr. J. Ewing Mears, of Philadelphia, Pa., reported a case of encysted dropsy of the peritonæum in which the abdominal cavity had been opened, large quantities of pus evacuated, and the case subsequently conducted to a successful termination by washing out the cavity with weak carbolized solutions injected through a large flexible catheter, there has been great progress made in this branch of our science, and I think I may venture to say that it is quite a common thing to-day, among our experienced surgeons, to open the cavity of the abdomen, notwithstanding the existence at the time of acute inflammation of the peritonæum. That the operation of laparotomy in certain pathological conditions of the vermiform appendix and cœcum is perfectly justifiable, I think I may say, in the light of the present literature on the subject, admits of no doubt; but the point on which there seems to be some diversity of opinion is, at what time the operation shall be performed. Are we justified in waiting for the evidences of an abscess before operating, or shall we pursue the opposite course and operate on the positive evidence of deep-seated inflammation? It was this very question which had to be considered in connection with the case under present consideration, and it is this question which may be given to either of us to-night to decide. The operation of laparotomy would have been performed in this instance had there been the usual evidences of the formation of an abscess. But in this case, as has been done in many others, we were waiting for something to show itself which would give us positive assurance of the existence of pus. The clinical history and symptoms pointed to an acute inflammation, and not to an old ulcerative process. There was nothing in the case which would lead one to suspect the true condition of affairs. There was not in this, as in some cases, the history of previous attacks. Repeated examinations per rectum were made by both Dr. Rockwell and myself, but with negative results.

The autopsy showed, however, that had an operation been performed it would have given the patient at least a chance for recovery; and, in view of our present knowledge on the subject, I think I may say a very fair chance. Up to very recently it was supposed that perityphlitic abscesses were in the great majority of instances extra-peritoneal; and I notice in the article on the subject of their treatment in "Ashurst's Cyclopædia of Surgery," published quite recently, it is stated: "As the purulent matter is altogether external to the peritonæum, and as the latter is not involved in the operation, there is little or no danger attending it."

This question of intra and extra-peritoneal inflammation seems to

have long kept surgeons on the ragged edge, and they are in the habit of waiting for a supposed extra-peritoneal abscess to be good enough to come to the surface and be opened; while in the meantime valuable life is lost by the development of an insidious peritonitis, or the rupture of an abscess, with the same result. A careful consideration of the more recent information contributed on this subject by the surgeons who have given it the most attention, will, I think, convince one that diseases of the cæcum and its surroundings are intra-peritoneal and that they usually find their origin in inflammation or perforation of the vermiform appendix caused by foreign bodies, fæcal impactions, etc.

Frederick Treves, Professor at the Royal College of Surgeons, and Surgeon at the London Hospital, after a careful examination of one hundred specimens, shows how completely these organs are surrounded by peritonæum, and adds: "The relations of the cæcum to the peritonæum are of great interest in surgery and medicine, the part being so frequently the seat of trouble. It has, I notice, been recently proposed that in certain inflammations the gut be reached by an incision through the loin, the incision not to include the peritonæum, but the gut to be exposed at its hinder part. I would take the liberty of stating that such a procedure is anatomically impossible."

If these views are accepted, and it is conceded that the so-called extra-peritoneal abscesses originate from perforation of the appendix or cæcum and are in reality intra-peritoneal, there is but one proper method of procedure in all cases not yielding to palliative means, namely, the operation of laparotomy, opening the abscess, breaking up adhesions, and draining.

In an article written by Dr. R. F. Weir, entitled "A Plea for Earlier Operations in Perityphlitic Abscesses," and published in the *Medical Record* of June 11th, 1887, after going over the subject very exhaustively and citing cases, he arrives at the following conclusions: "First, that the generality of perityphlitic abscesses are due to inflammation or perforation of the appendix vermiformis; second, that the mortality in such lesions is greater prior to the third day; third, that as soon as it can be recognized pus should be evacuated extra-peritoneally if possible, or by lateral laparotomy, and the cavity drained; fourth, that if aspiration fails to detect pus where a tumor exists, it is wiser to make an early extra-peritoneal exploratory incision; fifth, that where general peritonitis is progressing with any history of a right iliac pain, a limited lateral or median laparotomy should be made to expose the region of the appendix, within forty-eight hours from the inception of the disease; sixth, that if pus is thus recognized, it should be evacuated, and a drainage-tube inserted without toilet of the peritonæum."

In a communication to the Congress of American Physicians and Surgeons, held at Washington, D. C., September, 1888, on the subject of the "Surgical Management of Typhlitis and Perityphlitis," Dr. W. T. Bull says: "Suppurative perityphlitis may be a spreading or limited (circumscribed) perityphlitis. Both begin with the same set of symptoms, and it is important to discriminate between them in the first twenty-four or forty-eight hours. The presence of any of the local or constitutional signs of general peritonitis justifies the diagnosis of a spreading or generalization, and calls for the performance of laparotomy and repair of the lesions found. The absence of these signs, or their strict localization, warrants delay of varying length. (Any time after a week the abscess may be opened by an incision which must reach the pus, whether it be extra or intra-peritoneal). In doubtful cases the risk of the operation is less than the risk of the disease."

The surgeon just referred to has reported numerous cases which undoubtedly justify his conclusions. But a case reported in the *Medical Record* of February 2d, this year, by Dr. A. M. Jacobus, Instructor in Gynæcology at the New York Polyclinic, is particularly interesting. The patient was a painter, aged fifty years, and was first seen by Dr. Jacobus October 23, 1888. At that time he was suffering from right iliac pain. He gave a history of having suffered occasionally for several months, and on the day mentioned he had been at work fresco-painting, although feeling uncomfortable in his bowels. The evening before Dr. Jacobus was called he was suddenly taken with a very violent intestinal pain, which was temporarily relieved by domestic remedies. When the doctor arrived he found him in bed lying on his left side with his knees drawn up, groaning, and complaining of increasing pains all over the abdomen, but much more severe on the right side. His temperature was $100\frac{1}{2}^{\circ}$, and his pulse 98. He was constipated, his bowels not having moved for several days. There was slight general tympanites, with hardly any dulness over the cæcum, and great tenderness on pressure. The diagnosis of appendicitis with peritonitis from probable perforation was made, and the expectant plan of treatment was adopted, under which the patient seemed to improve. But when seen again, forty-eight-hours after the first visit, his condition had become so grave that laparotomy was decided upon, but owing to the lateness of the hour it was deferred until the next morning. The operation was then performed by Dr. Gill Wylie, and is described by Dr. Jacobus as follows:

"The patient's abdomen and the hands of the operator and assistant having been previously washed with a solution of bichloride (1-2000), it consisted in cutting an oblique opening down to the peri-

tonæum just above the crest of the right ilium, and, later, another opening in the the median line just below the umbilicus. The peritonæum, deeply congested, presented in the lateral opening, and was bulged out by an indistinct mass of intestines. A hypodermic syringe withdrew some serum, but no pus. For fear of injuring the intestines, which appeared to be matted together, and in order to do a thorough operation, Dr. Wylie then made an incision in the linea alba, below the umbilicus, when again the peritonæum, greatly congested, protruded from the opening. Upon incising it, a little gas and a pint or more of purulent serum, with large flakes of lymph, escaped. There was a fetid odor, but no discoverable fæces. The peritonæum was inflamed and granular, and the intestines, excepting those in the pelvis, were entirely matted together by quite firm adhesions. The wisdom of the median incision was now apparent, for in no other way could the adhesions be broken up or the abdominal cavity thoroughly cleared of the septic material which had escaped or been developed in it. Dr. Wylie introduced his hand into the median opening, and very carefully broke up the adhesions and pockets of purulent collections between the intestines. The appendix was found pointing upward (on the cæcum) and firmly fixed in a (ruptured peritoneal) sac, which latter readily admitted the finger. A hard body, one-fourth by one-half inch in size, apparently a bean, was discovered lying beside the appendix, in the sac, having evidently recently escaped from it. The lateral opening in the abdomen was then made complete, and the whole cavity thoroughly washed out with plain boiled water at a temperature of 110°. About five gallons were run through with a fountain syringe having a glass nozzle one foot in length and as thick as your finger. The doctor during the douching separated the intestines in every part of the abdomen with his hand; when the water ran clear the douching was stopped, enough water left in the abdomen to float the intestines, and the wounds sutured in the usual manner with interrupted deep and superficial silk sutures. A glass drainage tube was inserted in each wound, that in the latter being placed in the sac containing the appendix. The appendix being fixed, the bowel empty, and no fæces escaping, it was not disturbed or sutured. Iodoform and absorbent dressing were applied as usual." This patient made a complete recovery, and was up and about the house within three weeks after the operation, convalescence having been much prolonged by an accident occurring about the sixth day. The stitches having been removed, the patient overexerting himself reopened the wound, allowing the intestines to protrude, thereby causing much alarm among the physicians and nurses.

In closing his report of the case, Dr. Jacobus suggests the following

conclusions : * First, that typhlitic diseases are intra-peritoneal ; that in nearly every instance they originate in inflammation or perforation of the appendix or cæcum, usually caused by fæcal impaction or foreign bodies ; that even though these diseases frequently do not primarily end in suppuration, still their tendency is to recur and eventually end fatally by septicæmia, or shock from ruptured abscess or purulent peritonitis. Second, that in view of the foregoing, all diseases of this region giving symptoms of inflammation or peritonitis, without regard to the question of pus or abscess, and which do not yield promptly to the modern medicinal treatment and are progressive, should be treated by laparotomy at the earliest possible period. Third, that when peritoneal or intestinal adhesions or pus sacs exist, they should always be broken up, the abdominal cavity thoroughly douched with sterilized plain water at a temperature of 105°, the wound sutured, and the cavity drained by glass tubes. Fourth, that, except in doubtful cases of simple post-cæcal abscess unaccompanied by peritonitis, the incision should be made either vertically over the caput coli (after Sands), or in the linea alba below the umbilicus, and preferably the latter operation when extensive peritonitis or adhesions is suspected.

After the expression of such positive opinions as these by men who have given the subject so much attention, there does not seem to be any room left for doubt as to what course one ought to pursue when called to decide in a matter of so much importance. It should be borne in mind by the general practitioner that in the majority of cases surgical procedure is absolutely necessary.

With our present knowledge as to the low rate of mortality where the operation of laparotomy has been performed for the removal of tumors in extra-uterine pregnancy, pyo-salpinx, etc., we may expect even a better result when the operation is done early, and with the proper antiseptic precautions, for typhlitic disease.

TREPHINING, OR RESECTION OF THE SPINAL COLUMN, WITH THE REPORT OF A CASE.

BY J. E. RICHARDSON, M.D.,
Surgeon to the Brooklyn Orthopedic Infirmary.

Read before the Brooklyn Surgical Society, Thursday, April 4th, 1889.

The operation of trephining or resection of the spinal column is one which is entitled to the most thoughtful and earnest consideration on the part of surgeons.

It is with a view to introducing this subject for discussion, that I report the following case, and it is not to this case alone that I desire the discussion to be limited, but rather to extend to the general subject of trephining the spinal column, and to ascertain under what condition, if any, in the opinion of this Society, is the operation justifiable.

H. F. M., aged twenty-two years, by occupation an apprentice at carving, came to the Brooklyn Orthopædic Infirmary in June, 1888, suffering from a swelling upon the back of the neck, extending from the third to the seventh cervical vertebra. The spinous processes were completely covered and could not be outlined through the tumor; there was stiffness of the neck, with limited movement of the head, and pain on pressure over the cervical spine.

A thorough physical examination was made, and it was found he had valvular disease of the heart; and a partial consolidation of the upper lobe of the right lung, with evidence of chronic pleurisy. He is anæmic and appears to be in poor health. His father says that from birth he has never been strong, although never seriously ill.

There is no history of any injury having been received. His father is perfectly healthy, but his mother died from the effects of cancer of the breast. The tumor of the neck was first noticed during the previous autumn. At intervals it seemed to diminish, and again become quite prominent.

As he had an opportunity, it was recommended that he be sent to the country for the summer. He was at the same time put upon a tonic treatment. At first there was a slight improvement in his health, but early in the month of August he complained of numbness of the hands, especially the left hand. At this time there was partial paralysis of the sphincters of the bladder and rectum. During the month of October he began to develop a weakness of the lower extremities, which was gradually progressive from this time. His gait became uncertain, and on several occasions he fell, and was unable to get upon his feet again without assistance.

He came to the Orthopædic Infirmary again about the middle of November, and at that time the spinous processes could be distinctly felt through this swelling upon the neck. It seemed to have divided, lying upon each side of the spinal column. At this time he had considerable difficulty in breathing, and also required assistance in dressing. An unfavorable prognosis was given, and he was transferred to the wards of the Brooklyn Hospital on December 2d.

At this time the enlargement upon the back of the neck was more marked, especially on either side of the fourth and fifth cervical vertebra. The paralysis of both upper and lower extremities had increased.

In walking, the limbs were moved in a jerking manner, and the

patella reflex was increased. The arms could not be raised higher than the shoulders; there was marked loss of power in the flexor muscles, and the hands were cold and numb. He seems cheerful, and his appetite is good.

December 10th.—Paralysis has greatly increased in both upper and lower extremities, and he has but little use of his limbs. A consultation of the surgical staff was held. The patient and his father were anxious to have everything done that was possible, and as he was rapidly growing worse, it was decided to operate, and try to relieve the cord of the existing pressure.

December 11.—Dr. Bates, being on service at the time, performed the operation of trephining or resecting a portion of the spinal vertebræ.

As soon as the patient was anæsthetized the tumor over the neck immediately disappeared, and it could then be seen that it was caused by the contraction of the muscles of the neck, in their endeavor to hold the head and neck erect.

An incision was made extending from the occipital protuberance to near the spine of the seventh cervical vertebra, and dissecting down to the spinous processes, the lamina of the fifth cervical vertebra was removed with the trephine. The cord was then distinctly seen. It was supposed that there might be an accumulation of pus within the spinal canal, the evacuation of which would remove the pressure. It was found, however, that none existed, and it was decided to do nothing further. The operation was performed antiseptically, and the wound washed out with a solution of bichloride, 1 to 2,000; drainage tube was inserted into the wound, and the latter then closed and dressed. Iodoform being sprinkled over the surface of the incision, and then dressed with absorbent and bichloride gauze. Several members of this Society witnessed the operation.

Immediately after the operation, the respiration was ten to the minute. A hypodermic solution of sulphate of atropia of $\frac{1}{120}$ grain was administered, and brandy as required, and respiration soon became normal.

After the operation there was a decided improvement in sensation.

December 12th.—There has been considerable oozing from the wound. His extremities are warm and moist, but they are completely paralyzed.

December 13th.—Slight elevation of temperature and considerable anxiety expressed in patient's countenance.

December 14th.—Temperature A. M. 102° F. Great uneasiness; has neither sensation or motion below the neck. Breathing rapid and shallow. There was a rapid increase of fever until 12 P. M., when it

was over 108° F. He died at 1 A. M., December 15th, four days after the operation.

Autopsy.—Upon examination of the spinal column, it was discovered that there was caries of the bodies of the fourth and fifth cervical vertebræ, which produced an angular deformity at this point, with consequent pressure upon the spinal cord. The cervical portion of the cord at which pressure occurred, was flattened and increased in size. It was sufficiently firm to allow sections to be made of it in the fresh state. The dorsal and lumbar regions of the cord were quite softened. There was no distinction to be made between the gray and white matter of the cord, the degeneration was so marked.

With the indications which existed for an operation in the foregoing case, it seems to me to be not only justifiable, but absolutely imperative upon the surgeon to perform the operation, and give the patient a chance for his life, in what would inevitably and speedily be a fatal termination. In Gross' Surgery it says: "If foreign matter be present pressing upon the cord, it should if possible be removed, although in attempting to do this there may be great risk of increasing the original trouble."

The point of special interest in this case is the extreme rarity of a case of Pott's disease resulting in paraplegia. It is very rare that we find a case of progressive spinal caries either associated with or followed by functional disease of the spinal cord, and still more infrequently is it followed by organic disease of the cord. Permanent loss of substance may take place in the bodies of the vertebræ and the intervertebral fibro-cartilage, resulting in very great deformity and the approximation of the bodies of the vertebræ above and below the diseased bone, and yet there be not the slightest compression of the cord and no interference whatever with the functions of the cord.

It is a fact that paraplegia is more apt to occur in cases in which the diseased action is rapidly progressive, as in the present case, and the paraplegia is due more to softening or fatty degeneration of the cord.

From the time of the first recorded operation of trephining the spinal column by Mr. Henry Cline at St. Thomas' Hospital, June 16, 1814, down to the present, there has been considerable diversity of opinion among surgeons in regard to the propriety of performing the operation.

Mr. Cline said he believed the operation had hastened the patient's death.

In the *London Hospital Reports*, vol. iii., p. 357, Mr. Jonathan Hutchinson, who has had much experience in injuries of the spinal column with accompanying injury to the contents of the spinal canal,

says: "I have taken part in not a few consultations where the question of operation was entertained, and have always dissuaded from it as strongly as I could. He says further: "My assertion is that a good many cases recover, if put under favorable circumstances and let alone, and of those which end in death, very rarely indeed can it be asserted after post-mortem examination that an operation could by the barest possibility have done any good." If then an operation can do no good, it would add to the patient's suffering and greatly increase the danger.

He reports twenty cases of injuries to the spinal column, four of which greatly improved, even after the paraplegia had lasted some weeks. In drawing conclusions from autopsies of at least twenty cases, he claimed it is a very infrequent event for the spinal cord to remain permanently compressed. The injury is in the nature of a sudden crush at the time of the receipt of the injury, and displacements of a permanent character are not met with more than about once in ten cases. Owing to the size of the canal, slight irregularities of the bones may occur without any compression whatever of the cord. The laminæ seldom cause direct compression of the cord; occasionally, however, in direct blows with fracture, it is possible that a lamina may be the cause of direct pressure upon the cord, and there remain; but this would occur very rarely. While in almost every case the spinous processes and laminæ are fractured, yet he has never seen a case in which they were in direct contact with the cord.

In Gross' System of Surgery, vol. ii., p. 94, it says: "Trephining or resection will not be likely to be of any service, the operation which has been tried in a number of cases of depressed fracture of the vertebræ, seldom having been productive of the slightest benefit, much less of complete recovery."

Ashurst's International Encyclopædia of Surgery, vol. iv., p. 785, says: "The operation of trephining or resecting the vertebræ is unjustifiable, because it does not offer a reasonable prospect of improving the patient's condition in any case; while, on the other hand, there is always reason to fear that it may increase the chances of a fatal termination."

On page 890 of the same work, there are forty-three cases of this operation recorded. Of this number thirty-one patients died; four were not benefited; four were relieved; and in the remaining four the results are unknown.

Sir Benjamin Brodie says: "That as the body of the vertebra was in the vast majority of cases the seat of fracture, and as this part was out of reach, no good could be obtained by operative interference."

Holmes' System of Surgery, Vol. I., p. 815, says: "The prin-

cial aim in the treatment ought to be an endeavor to preserve life, without incurring formidable risks in expectation of getting rid of paraplegia."

The first so-called successful case of trephining the spinal column, so far as I am able to ascertain, was reported to the Royal Medical and Surgical Society, at its meeting November 28, 1865. The case was that of a young man who was thrown from his horse, March 27, 1865, sustaining a fracture at the junction of the last dorsal with the first lumbar vertebra, with displacement. He was at once affected with paralysis of the lower extremities, rectum and bladder.

Dr. Samuel Gordon performed the operation of trephining at the patient's urgent request. Signs of improvement soon followed after the operation; sensation improved rapidly, and later an increase of motor power, and still later power over the bladder and rectum was restored, and within eight weeks he was allowed to go out riding. This case showed there was nothing in the operation of a necessarily fatal character.

Mr. Wm. Adams says: "He would have no hesitation in a case of fracture of the spine, when there was compression in trephining or removing the posterior arches of the spine;" and he remarks further, "It is true the compressing cause is in front, and depends upon the displaced vertebral body, but the cord is compressed between this and the arches posteriorly, so that by removal of the laminæ this compression may be relieved." When the cord itself was not lacerated, as it is sometimes found to be in the more severe injuries, the prospects of relief from the operation were favorable.

In Gross' System of Surgery, Vol. II., p. 94, it mentions a case by Dr. W. W. Keene, illustrating how much injury may be inflicted upon the spine without a fatal result. The patient was wounded at the battle of Gettysburg. The ball entered the upper lip and lodged in the body of the third cervical vertebra almost completely comminuting it. Altogether about sixteen pieces of bone were discharged or removed, one being the anterior half of the vertebral foramen. At first paralysis of all the extremities existed, but disappeared after the removal of the ball; the man subsequently re-entered the service, and recovered without any deformity of the neck, although nearly the entire body of the vertebra had been destroyed.

There are recorded cases, although but very few in which hæmorrhage into the spinal canal has been sufficient to produce compression of the cord, and in the vast majority of cases there is little or none. There will be but little hæmorrhage between the bone and the theca, and none at all in the thecal cavity.

Dr. Stephen Smith performed the operation of trephining the

spinal column in order to relieve the spinal canal of extravasated blood, which was compressing the cord, and yet after the removal of from eight to twelve ounces of blood the paraplegia gradually advanced and produced death by asphyxia.

It would seem that the class of cases which would offer the most encouragement for this operation is that in which the compression of the cord is due to the pressure of a tumor; and as our methods of diagnosis improve, we will be better able to determine the exact location of tumors of the cord.

The case reported to the Royal Medical and Chirurgical Society, January 24, 1888, illustrates this class of cases. The patient was a man, who had suffered for three years very acute pain located just below and near the angle of the left scapula. Below this point there were almost complete anæsthesia and paraplegia. The diagnosis of tumor of the spinal cord was agreed upon. Mr. Victor Horsley performed the operation for its removal. The spines and laminæ of the fifth and fourth dorsal vertebræ were removed without result, and then the greater part of the third vertebra was removed, revealing a myxoma about the size of a filbert, which was compressing the cord; the pain gradually diminished and motor power slowly returned to the parts, and in seven months they were almost natural.

The opinions of surgeons in regard to this operation differ very greatly, those who oppose the operation as unjustifiable, and those who are favorable to its performance in certain cases.

The points which present themselves to the surgeon contemplating the operation would naturally be: Is it possible or probable that the condition for which the operation is performed may be relieved; and what are the special dangers of the operation?

Complete paraplegia is not necessarily a fatal condition even though it be associated with fracture of the spine. The degree of recovery of the functions of the cord will of course be dependent on the amount of disintegration of the cord, and as yet we have no means of diagnosing this at a time at which an operation would naturally be most successful. An operation if justifiable would naturally meet with the greatest degree of success if pressure exists and can be removed before any structural change can take place in the spinal cord, and before the muscles have undergone atrophy from which they cannot readily recover.

But being unable to diagnose accurately the exact condition of the cord we might by the operation destroy the only chance of recovery the patient has, if it were not a suitable case to be operated upon.

If we operate in recent cases of fracture of the spinal column with compression of the cord, a simple fracture is thereby converted into a

compound fracture, and we open the spinal column to the dangers of the entrance of inflammatory products within the canal.

The time may come in the future when it will be possible to diagnose with a greater degree of accuracy the exact extent of the injury inflicted upon the cord in any case, and be able more intelligently to decide the cases in which operative procedure would be justifiable.

DISCUSSION.

Dr. PILCHER.—At the outset, with reference to the case itself that is reported, upon which the general remarks are based, I would be glad if the reader of the paper would permit me to ask if he was able, satisfactorily to himself, to make out the cause of the rapid advance of threatening and finally the fatal symptoms after the operation?

Dr. RICHARDSON.—I presume it was a rapid extension of an inflammatory condition which already existed there, and which, in the history of these cases is very apt to terminate fatally. There was an inflammation of the meninges, and there also existed an acute myelitis, which was induced by disease of the vertebræ and compression of the cord, and would account for the rapid advance of the case to a fatal termination.

Dr. PILCHER.—At the post-mortem examination was there any hæmorrhage discovered?

Dr. RICHARDSON.—All we could detect was a small clot which was at the bottom of the wound.

Dr. PILCHER.—The operation was undertaken for the purpose of removing an apparent compression of the cord. At the time of the post-mortem were the evidences of compression plainly found?

Dr. RICHARDSON.—It was very evident at the time of the post-mortem. The flattened condition of the cord showed conclusively that it was produced by pressure.

Dr. PILCHER.—And yet the cavity of the canal there is very much greater than the volume of the cord, and from this specimen (referring to section of spinal column produced by Dr. Richardson) one would hardly suppose that there would be enough displacement caused by that deformity to encroach upon the cord.

Dr. RICHARDSON.—That is very true, and yet that does not in any degree show the amount of curvature. It does not show the amount of angular deformity that existed at the time of the autopsy; it was almost an acute angle. The autopsy showed conclusively that the mechanical pressure was the cause of the meningitis and the myelitis.

I might say right here that there was quite a difference of opinion as to the cause of the paraplegia; several believed it was caries, and

others believed it was caries with purulent matter in the canal ; and it was with the idea of evacuating the canal, not with the hope of ultimate recovery, but in the hope of prolonging life, that the operation was undertaken. Others thought that the tumor in the region of the neck was in some way compressing the cord, and possibly a removal of that would give him a more permanent relief.

Dr. PILCHER.—With regard to the general question of the justifiability of interfering in affections of the spinal column where there are evidences of compression of the spinal cord. While I have had no personal experience in the performance of any such operation, yet naturally, with all surgeons, my attention has been drawn to it, particularly within the last two years, and I have given it sufficient thought to outline for myself a line of action which I should pursue in the future in any cases which might come under my care.

The question arises, first, as to the diagnosis of any case. In a certain number of cases the diagnosis as to difficulties arising from compression of the cord, by conditions external to the cord, will be clear. In other cases they will be doubtful. It seems to me that wherever we have adequate reason to believe that there are sources of compression upon the cord, that it is justifiable for us to attempt surgically to relieve that compression. And from this standpoint, reviewing the history of the case which has been presented this evening, it seems to me that that attempt was abundantly justifiable ; and, even more, that in the light of more recent experience which has been put upon record, of good results which have followed such attempts, for the surgeon to have declined making the effort would have been reprehensible. Perhaps I should not say reprehensible, for in any such case as that any one must have the privilege of choosing whether he will accept or refuse certain responsibilities. At the same time a surgeon refusing to make the attempt to relieve such a case as that might justly be charged with failing to do all that recent surgical experience has abundantly proved might be done for the relief of such cases. So that it seems to me that even the unpleasant termination of this particular case can leave nothing of regret in the minds of those who had to do with it, as to having made the attempt to accomplish relief.

The chief dangers which are to be apprehended in any of these attacks must be, barring accidents in the course of the operation itself, those of an inflammatory kind, supervening in the future course of the case, after the operation. In the former days, during which Mr. Hutchinson particularly had his experience, which has been referred to by the reader of the evening, undoubtedly the dangers of such inflammatory complications were very great, and were justly taken into

consideration as of sufficient gravity to make it undesirable to incur them in the care of any case, particularly as in a certain proportion of cases gradual improvement has been found ultimately to take place. But I think there is enough in our more recent experience to cause us to feel a reasonable degree of certainty that serious inflammatory complications should be the rare exception and not the rule. Such, certainly, has been the experience of such operators as McEwen and Horsley and Abbe.

It is only recently that I had the privilege of being present at an operation performed by Dr. Abbe for the relief of complete paraplegia, supervening upon a blow in the back which a stout, robust man had sustained. I think it was the pole of a wagon that struck him in the small of the back. At the end of six weeks, there being no improvement in the symptoms, the lumbar portion of the spine and the lower dorsal were exposed, and the laminae of the lower two dorsal and the upper three lumbar vertebrae were removed. The dura mater of the cord was opened freely throughout this extent, and not until it had been opened up to the upper angle of the wound did they find the real lesion, which was a pulpification of the cord at that point. Notwithstanding this extensive operative traumatism, the extensive wound healed by first intention, without an unfavorable symptom. The patient's condition was not particularly improved, but the fact of there being no displacement which might have been removed was demonstrated, and the diagnosis was cleared up. This I speak of as an illustration of what, with care, it seems to me we have reason to expect to accomplish in our attacks upon the spinal column and the meninges which envelop the spinal cord. So that if there is a compression of the cord between the anterior and posterior walls of the canal, or by the presence of a clot within the canal, or by the presence of a purulent effusion, or by the presence of a neoplasm, if in any of these ways there is compression upon the cord, or we have strong reason to believe there is compression upon the cord, I believe we are justified in making such surgical attack as may be necessary to demonstrate it and to remove it. And, indeed, that if we did not do it we would be more to blame than if we did it and disaster followed our attack. That is the position which I have adopted as a rule for the guidance of my own action in these matters.

Doubtless the success or non-success in these attacks will depend very much upon the perfection of our operative technique, and doubtless the success we shall have in our earlier attacks will be much less than that after experience has been accumulated. But, certainly, the only way to get that experience which will enable us to get the best results is by beginning and doing the best we can and improving as we go on.

Dr. FOWLER.—I do not know that I can add anything to the remarks of Dr. Pilcher on the general subject of resection of portions of the spinal column for pressure, but would insist more strongly upon the necessity of early interference in this class of cases. When a lesion of the bony column has occurred, either from fracture or disease, and the symptoms are due to compression of the cord, I would be in favor of interference.

It is important to restore the cord to its normal condition, give it the room which it requires, before extensive disintegration or disease has resulted from pressure. I have operated three times for the relief of pressure upon the spinal cord. All three cases, however, were the result of injury due to accident, and all three patients perished. In the first two cases upon which I operated the laceration of the cord from the pressure of the broken and displaced laminæ was so great as to put entirely beyond question the possibility of the recovery of its function, or even the recovery of the patient from the immediate effects of the accident.

Those are the only two cases in which I had an opportunity to operate early.

In another case, which came into my hospital service, I was not informed of the presence of the patient in the hospital, owing to misunderstanding, until sixteen hours after the accident. I hastened at once to remove the pressure, due, in that instance, to the displacement of the laminæ. The cord had been pressed upon for sixteen hours; the pressure was relieved, and the patient did well for several days; yet the destructive processes set up in the cord by the pressure were such as to lead to general myelitis, and the patient died.

The inflammatory processes, as has been suggested, are probably in great measure due to faulty technique and, not among the least, the absence of proper antiseptic precautions. There are so many places where danger may creep in, that, in an operation of this unusual character, I can very easily understand how much more difficult it is to carry our antiseptic technique to the highest perfection.

Dr. ROCKWELL.—I did not hear the whole of the paper; but I conclude from the closing remarks that the author has come to the conclusion, as to the question of the justifiability of an operation in this class of cases, that the operation is not one to be recommended or followed. In that respect I should differ with him, for on the general question I have already made up my mind what my plain duty would be.

The conservative school of surgeons would make the point against Dr. Pilcher (and doubtless it is a rule) that the diagnosis cannot be made clearly enough in obscure cases, in the first few hours, to warrant interference; but I think the plain answer to this objection is

that even if an unnecessary operation be done on a case in which the diagnosis is obscure, the traumatism itself is but a slight complication of the remedial steps which Nature herself will take to put the patient again in possession of his functions; and therefore, in case the original injury proves to be a slight one, the operation has added little or nothing to the risks of the patient.

It may be asking too much, perhaps, of the future; but it seems to me possible that a restoration of the functions of the spine itself may be achieved by the replacement of some of the displaced bones. I have had an experience in trephining the skull which makes me believe that large masses of bone replaced in the places from which they have been taken will heal kindly and with very little trouble. This, if generally true, would of course rob the operation of some objections which might now obtain. In the case to which I refer, three out of four large buttons of bone which had been removed in an exploratory trephining were reimplanted, having been kept in a warm solution of hydronaphthol, and within two weeks they were immovable, and remained in place perfectly without any trouble at all. This method, of course, is different from the ordinary plan of breaking up the bone, as practised by McEwen. They were replaced *en masse* as they were taken out, and yet, with the intervening space as great as it was between the buttons and the skull surrounding them, they held perfectly and are apparently now a part of the skull again. This was in the case of a young adult, a result that might not perhaps be expected in an older person.

I would like to ask, as a matter of information, if any of the gentlemen know of cases in which portions of the spinal column have been replaced after operation as other portions of the bony structure have?

Dr. PILCHER.—I think they have, but I can't give you the reference now.

Dr. RAND.—It has seemed to me that the special field for the trephine is in fractures of the spinal column and not in the class of cases to which the one here reported belongs. Paralysis in these cases usually disappears under the ordinary treatment by gradual and moderate extension, with fixation of the spine. And while I believe it is good surgery to trephine in cases of fracture accompanied with symptoms of compression, I would not endorse the opinion that the trephine should be resorted to in paraplegia due to caries of the spinal column.

Dr. PILCHER.—I would like to be permitted to ask Dr. Rand what his opinion would be in cases of caries with compressive symptoms in which the efforts at extension and fixation had been systematically and

for a proper time continued without relief, whether he would say in such a case trephining would be advisable?

Dr. RAND.—Where fixation with extension had been tried without benefit I should say trephining would also fail. In a case like the one here reported, it would be impossible to get the full benefit of extension and fixation except by complete rest in bed. I don't believe that in such a case of caries any apparatus would bring about the desired object, but I believe that rest in bed with extension from the patient's head, thus removing its entire weight from the diseased vertebræ, will do more toward putting a patient in a fair way for recovery than removing a button of healthy bone. Much depends upon early treatment, and the method of carrying it out.

Dr. PILCHER.—My question was not limited to this operation on the spinal column alone, but any operation upon the spinal column, dorsal and lumbar as well.

Dr. RAND.—If I had good reason to believe there was extensive effusion or pus in the canal, I might, as a last resort, trephine, but it would be without much hope of success. If there was sudden displacement from an injury occurring in a case of caries of the spine, why then I think trephining would be a good procedure.

Dr. PILCHER.—If I might be permitted to ask yet another question, I would like to say that doubtless Dr. Rand must take into consideration, and probably does, in his remarks, and in his reply to my question, the fact that oftentimes these paralyzes are present in the late stages of caries of the spinal column where active disease had been arrested, and where with the previously diseased and vanishing bodies a sharp angle is made and the cord is pinched between the collapsed bodies and the laminae, not as the result of acute inflammatory changes of any kind, but as the result of slowly produced narrowing of the spinal canal from these ultimate changes. Does his recommendation not to employ the trephine apply to such cases as that?

Dr. RAND.—No, I was not referring to that class of cases, but rather to those which had come in my own experience, where paralysis occurred during the active stages of the disease, and my remarks would not apply to paraplegia occurring after the disease had subsided.

Dr. FOWLER.—I don't know that the treatment of Pott's disease is under discussion, but I would like to call attention to the fact that in cases of paralysis following caries of the vertebræ the paralysis does not come on as a rule until the osseous tissues have become pretty firmly consolidated, and the gradually increasing deformity due to this is really the cause of the paralysis. And I imagine in that class of cases it is extremely hazardous to make extension of any kind; that

frequently a disease of the vertebræ is aroused anew ; it is quite the rule where secondary attacks of this kind occur for the case to go on to rapid suppuration, and death is the result.

Dr. RAND.—Do I understand you to say that you rarely ever get paralysis until the inflammatory process has subsided ?

Dr. FOWLER.—Yes, until the maximum amount of angular deformity occurs. In my experience, I have never seen one which occurred in the acute stage of the disease.

Dr. RAND.—In cases coming under my own observation, paraplegia has occurred most frequently during the progressive stage of the disease, and been due, probably, to pressure of inflammatory exudate and not to pressure of bone. At all events, while I have treated a number of such cases with both partial and complete paraplegia, they have, as a rule, recovered the use of their limbs long before they could safely go without support.

Dr. FOWLER.—The particular case in my mind was one that came under my observation, and was that of a young lady whose disease had been quiescent, perhaps cured, for more than ten years. There had previously existed slight symptoms of paralysis. Extension and the application of a jacket resulted in a renewal of the disease and the formation of abscesses ; there was no relief from the paralysis, the suppuration was followed by waxy liver and kidneys, and I made out her death certificate quite recently.

Dr. RAND.—I thoroughly disapprove of much extension, but I believe in moderate extension sufficient to remove at least a part of the superincumbent weight. How do you think trephining would have resulted in that case ?

Dr. FOWLER.—The case when I saw it was not a proper one for operative interference of any kind. I am not able to judge what would have been the result had trephining been attempted earlier, but I believe it would have been far preferable to the attempt at extension which was made.

Dr. LEWIS.—I believe myself that the apparently unanimous opinion of the authorities against trephining will be very much modified in the later editions. I believe that as surgery is advancing all the while that the opinions which have been standard and are to be quoted now as the opinions of the authors, will be very much modified. And I believe also in the principle that has been enunciated here, that where you can relieve pressure from the spinal cord, it is justifiable and proper to do it, but I believe it will be a good while before we shall get very pronounced success in acute cases of ordinary broken back which we have in our hospitals. While I believe operation is, in a number of these cases, justifiable and indicated, I believe as a rule

there is so much disturbance there, that our measure of success will not be very great for a while at least.

I think the field for success in trephining the spinal column is in that class of cases where we are pretty sure of tumor; in that class of cases which are not acute.

While I have seen a good many cases of broken back, sailors as a rule, most of them falling from heights, I never have trephined any of them, and I am not clear that in a majority of cases it would be indicated; but I do think that there is a class of cases where we can make out the character of the deformity so as to warrant us in interfering. I shall be, from this discussion, more in favor of it than I have been before.

Dr. RICHARDSON.—In regard to the remark of Dr. Rockwell that he understood me as being opposed to operative procedure in the classes of cases to which we refer. I certainly believe that in the case referred to in my paper it would have been unwise on the part of the surgeon who performed the operation had he declined to perform it, because it was the urgent request of the patient, and it was a case in which there was such a diversity of opinion, and with fair prospects of relief from an operation. It was not understood what it was, some believing that the tumor upon the neck was the immediate cause of the pressure of the cord, and others believing it was due to caries, but it was known there was mechanical pressure there, and it was considering the inevitably fatal character of the case that an operation was justifiable, and I believe was incumbent upon the surgeon.

I was not advocating trephining in cases of spinal caries, as Dr. Rand seems to infer, as I believe that above all others this would be the most unfavorable class of cases in which to operate. We cannot in those cases get at the source of the disease, and to trephine in such cases would be useless.

As I said in my paper, if we can choose our cases as those of tumors, I would be favorable to the operation; but in cases where you cannot estimate the degree of laceration or disintegration of the cord, it would be only adding to the almost certain fatality of the case to operate.

I should like to ask Dr. Pilcher what was the termination of the case to which he referred as having been operated upon by Dr. Abbe?

Dr. PILCHER.—Strangely enough, as Dr. Abbe informed me, for a few days after the operation there was a certain amount of sensation restored in the lower extremities, but not very great. What the man's condition has been since I do not know. I don't think from the conditions that were found at the time of the operation there was anything but life-long paraplegia. The operation was performed about a

month ago, and it was about two weeks after the operation that I had the report from the operator; what the further course of the case has been I do not know.

Dr. RICHARDSON.—I would like to ask one other question: Does any member of the Society know of a single successful case of trephining the spinal vertebræ? In this case to which I refer in the report as being a successful case, there is no mention made in connection with that case that the patient ever walked. It was said that he was able to be taken out riding in a carriage. That might have occurred very readily had there been no operation performed.

Dr. FOWLER.—McEwen has reported several successful cases.

Dr. PILCHER.—One of Abbe's cases which he trephined and removed a mass from within the spinal canal, was a man who was completely paralyzed before, and was afterwards able to walk. He had him afterwards at the New York Surgical Society and had him up at the State Medical Society also. He does not walk perfectly, but he walks.

Dr. FOWLER.—The cases I refer to are not cases of complete paraplegia, but the cases were said to have recovered.

The first of the cases operated on by McEwen was one of complete sensory and motor paraplegia, with incontinence of urine and fæces, which had been absolute for eighteen months, which had supervened late in the course of a case of Pott's disease. On opening the vertebral canal the operator found the compression to be caused by a fibrous neoplasm, of inflammatory origin, which partially ensheathed the theca. This was dissected away, and the cord permitted to expand. Rapid improvement of the paralysis followed. Five years afterwards he could walk for miles; attended school and joined in schoolboy games, even football. This, and other cases of spinal surgery, may be found recorded in the *Annals of Surgery* for October, 1888.

PROGRESS OF DENTISTRY DURING YEAR ENDING MAY 1ST, 1889.

REPORT OF COMMITTEE ON PRACTICE TO THE DENTAL SOCIETY OF THE
STATE OF NEW YORK.

BY RODRIGUES OTTOLENGUI.

Mr. President and Gentlemen:—Your committee has decided to offer you a report covering many branches in our profession, and therefore will proceed without any preamble, to be as brief as possible.

Surgery.—The operation of implanting teeth has attracted more attention than any new feature of dental progress in the last decade.

There has been abundant evidence to prove that it is possible for a tooth so placed to become firmly attached to the jaw. What the exact nature of this attachment is has not, in the opinion of your committee, been thoroughly settled. Dr. G. L. Curtiss's evidence in favor of ankylosis must stand until further investigation proves him wrong. As yet no sections have been through an implanted tooth and surrounding alveolus. Several gentlemen, however, are working in this direction, conspicuous among the number being Dr. Sudduth. We may therefore expect more data at an early date. Meanwhile an important point seems to have been settled which bears on the ethics of performing this operation. The teeth in their normal sockets are held by an intervening soft tissue—the peri cementum—between the tooth root and the bone. This wise provision of nature allows severe shocks to be received without injury. The force with which the jaws are brought together is greater than commonly supposed, as one discovers when the tongue is accidentally caught in chewing. The implanted tooth, however attached, is fixed. There is no protecting resiliency. It may therefore be retained indefinitely, and then rapidly lost by a retrograde process, the attachment first being shattered and rapid absorption of the root resulting. Your committee must not be misunderstood as indicating that there is no absorption of the implanted tooth in the first instance, the bays being filled in as is claimed by some. That is not yet determined. The point wished to be made prominent is the fact that when absorption sets in, *after the tooth has once become firm*, the destructive process is likely to be very rapid. The question arises, can such a condition be restored to health? Your committee has been most interested in this problem. During the year two such cases were treated. In both instances the implanted teeth had been in place over eighteen months. In one the fistula was healed after new bone had been induced to form, and to-day, five months later, all is well. In the second case, after the most strenuous efforts, including an attempt at reproduction of tissue by sponge-grafting the tooth was lost. That one case responded to treatment, however, is the point of value, since it proves that under favoring circumstances such healing is *possible*.

Such great progress has been made in crown and bridge work, and the success of implanting teeth is still so doubtful, that your committee would advise that implantation be resorted to *only where all other methods would prove failures*.

Pyorrhea Alveolaris—This disease is one which is at this time receiving renewed attention in consequence of the report of your last year's committee to the effect that in many instances the most unpromising cases yield readily enough if the treatment is conscientiously

followed up by both dentist and patient. Your committee for this year has to report that a number of cases have been treated and seen during the year, where the method of bridging together at the cutting edges with gold had been resorted to, and the results were most gratifying. This line of treatment may be thoroughly understood by any not already acquainted with it, by referring to articles in the journals during the last year, or by corresponding directly with Dr. M. L. Rhein.

Alveolar Abscess.—The advocates of immediate root filling have been so loud in their hurraing and so convincing in their arguments that they have converted the majority of our profession to their method. This, however, leaves alveolar abscess to be considered from a new standpoint. If the root is to be filled at the first sitting, it is possible in many cases where the condition of the end of the root is obscure, that shortly after such treatment positive evidences of abscess may present. To those accustomed to treat such conditions through the root canal this is a point to be pondered over. In such instances your committee has to report that the most satisfactory result may be hoped for, if the sac be burred off the end of the root with a sharp bur, passed through the soft parts and the alveolar wall. Where such an operation seems likely to produce pain, cocaine or gas may be administered, or ether spray may be used. Where pain may result and continues afterward, it may be abated with five grain doses of anti-pyrine. In performing this burring operation on superior bicuspidis or the buccal roots of superior molars, care should be taken not to enter the antrum, even though such an accident would not of necessity be attended by untoward consequences.

Drilling through Roots.—Your committee during the year has seen teeth lost in four cases by this accident, followed by unwise after treatment. In one a screw for a crown was passed through the side of a root, by actual measurement three-sixteenths of an inch, entering the process that far. A sequestrum of bone one inch long resulted from necrosis and four teeth were lost. In a second case a double rooted bicuspid was mistaken for a single rooted tooth, and in trying to form a straight canal the drill was passed between the two roots; gutta percha was passed into this hole, and the tooth filled with amalgam. Subsequently a great abscess formed and the patient lost confidence in the dentist. Every known remedy was tried, the roots being burred, but after three weeks' endeavor the tooth was removed. As this accident was at the hands of one of our most prominent members it would seem that your committee is right in recommending extra caution in drilling into root canals. The other two cases, both molars, were similar, and both were lost. Still a fifth case, a molar, however, was

saved. In that case the bur had passed through near the tooth neck, and no abscess was present. Decay had naturally attacked the tooth at that point, and a large cavity was found under the gum. The tooth was saved by thorough filling. It might be mentioned in passing that in the case of the bicuspid, another was implanted in its place, and seen within a month, six months later, is doing well. In that case the soft tissues were trimmed away about the hypertrophied borders of the fistulous opening with the scissors, and painted freely with salicylic acid (sat. sol. alcohol).

Filling Materials and Methods.—In this connection your committee would call attention to various points.

Porcelain.—Porcelain as a filling material seems to be a failure. In small cavities it cannot be used. In proximal cavities almost invariably, granting that a perfect filling can be baked, it is necessary to make unwarrantable destruction of tooth material in order that these fillings may be forced into position after they are ready. This might be excused, other objections being done away with, if the sacrifice was at the palatal aspect. In most of the cases exhibited to your committee, however, the reverse has been the practice, and the operators have cut away the labial faces of teeth, trusting to their skill to restore with porcelain. Your committee claims, however, that thus far fillings have not been made possible, either in regard to exactness of adaptation or of color. Tooth body, as is well known, is baked at a temperature which cannot be measured. The color depends to a very great degree on temperature, therefore it is manifestly impossible to obtain a given color, even though exact proportions of bodies be used together. As this is admitted by the manufacturers of teeth, it seems absurd for a dentist to hope for better results. As to adaptation, the amount of shrinkage depends on varying causes, and therefore is not controllable. Space exists at the margins, admittedly the most important part of any filling, and these are occupied by phosphates. Thus what should be the strongest point, in this kind of work is the weakest. When we can produce a phosphate or other light colored plastic which will not dissolve in the fluids of the mouth, we will be able to make porcelain fillings at least permanent. But when we have attained that goal we will not need porcelain at all, because we will be able in those halcyon days to produce better results with the plastic alone.

Copper Amalgam.—This material undoubtedly will continue to hold the high place in our confidence which it does at present. There are many places where it will serve us better than anything else. As to color, that is a question of æsthetics, and it is only a matter of opinion which is more beautiful, ivory or ebony. Copper amalgam,

if properly used and conscientiously polished at a subsequent sitting (the lapse of a week is better than a shorter time) will give us a surface like polished ebony, and we may educate ourselves and our patients to admire these beautiful black fillings, especially since the edges are so perfect. There is, however, a fact to be remembered always, and that is, that copper amalgam is not easily removed with a drill or bur. If a pulp is nearly exposed in an obscure cavity, say posterior proximal of second molar below, it will be safer after capping not to fill with copper amalgam, for should the tooth ache subsequently and it become necessary to remove the filling to reach the pulp great difficulty will present.

Plastic Golds.—The preparations known by this name may be made very serviceable provided they be not used exclusively. Either with crystal, or crystaloid gold, undoubtedly good fillings may be made in some instances, but such work is surely no better than the ordinary gold filling in any case, whereas in many instances it would prove entirely unsatisfactory. Therefore the use of these materials for entire fillings is to be deprecated. In sensitive teeth, however, where the cavity can be less painlessly made simply of a general retaining shape, without grooves or retaining pits, the plastic gold is invaluable for starting the filling, and may be used with safety for one-half or even two-thirds of the depth of the cavity, the completion being with foil, preferably of heavy gauge.

Gold and Iridium.—This is a preparation suggested by Dr. Wheeler of Albany. Iridium is laid between layers of gold, and rolled down to the thickness of forty or sixty foil. It makes a light colored filling with a glassy surface, which will wear better than any combination of gold in exposed grinding surfaces. It is, however, very difficult to manipulate, being very stiff and unyielding. Nevertheless it has a place among our filling materials, and when needed, however rarely, there is scarcely any substitute so good.

Gold and Platinum.—This is a combination which makes a very dense, durable filling, of light color. It is specially indicated for extensive contours in conspicuous positions, or where great strength is required, as in uniting teeth for pyorrhea. Those who have never used it should be very cautious at first, as this material is exceedingly difficult to manipulate. It tears readily under small points, and nevertheless too large foot pluggers should not be used. A long narrow foot plugger with fine serration seems best. The main point, however, is annealing. It is necessary, to obtain best results, that this should be thoroughly done and yet there is danger of burning off the thin outer layer of gold, exposing the platinum and thus preventing cohesion. Therefore it will be wiser not to depend on skill, but to

use the Johnson annealing apparatus with which the material may be heated to a bright red without burning. This device may be had of S. S. White & Co. It is in appearance like a small nutmeg grater, set at an incline over the spirit lamp, the heat passing through the little holes to reach the gold which is laid on the upper side. It is safer to anneal a large piece and cut in strips afterward.

Gold and Amalgam.—It has been demonstrated again during the year, though long ago discovered by Dr. Kingsley, that gold may be made to unite with amalgam at the same sitting, thus giving amalgam as a protection to the cervical border, where it has proven better than gold, and gold along all other edges where it is evidently better than most amalgams. In filling proximal cavities after this method a matrix is needed, securely placed. Amalgam is packed along the cervical border, and immediately upon it is packed plastic gold, preferably Steurer's, until the gold color persists, when the filling may be finished as any other gold filling with any foil which the operator may prefer. Your committee was shown test fillings made in this manner, a tube of glass one inch long having been filled half with amalgam and half with gold. Removed from the tube the union between the two was so perfect that it was impossible to break them apart with the fingers. Your committee recommends this method in cases where from extensive decay below the gum margin it would be difficult or impossible to fill with gold. When the depredation is so great that the cervical edge cannot be reached with the matrix, that portion may be filled before placing the dam in position, and the matrix adjusted afterward, when more amalgam must be put over that first inserted, to insure a surface free from moisture, before adding the plastic gold.

Gold and Oxy-phosphate.—Your committee wishes to attract special attention to a method devised by Dr. Reese of Brooklyn. In shallow cavities, the pulp being not exposed but nearly so, and where it would be dangerous to obtain sufficient retaining shape to the cavity, some "sticky" grade of oxy-phosphate may be placed over the bottom of the cavity, and before it is allowed to set a pellet of gold large enough to fill the cavity, is pressed gently into the cement, and then left undisturbed. When the cement has set it will be found that the piece of gold is firmly held; it may then be condensed and forms the foundation on which the filling is built. In this way the filling is actually *cemented into position*. Your committee after trial of more than two years has no hesitation in saying that this is a thoroughly reliable method of starting a filling and of additionally securing it. Of course it is not meant that large contours may be made to depend on the cement alone; judgment must be used, but a trial will convince anyone that this is a most valuable idea. It also serves well with amalgam

fillings, possibly better since such a filling may be completed without waiting for the cement to set.

Robinson's Felt.—This material is excellent for children's teeth and for beginning large cup shaped crown cavities, or any others of great depth. It is claimed that gold coheres to it. This, in the opinion of your committee, is an error. The felt may be placed in the lower part of a cavity and gold built on it. But the union is mechanical; that is, deeply serrated instruments must be used, thus forcing the gold into the softer mass of felt; in this way it serves well, clutching the gold sufficiently to aid us in making the filling. This union, however, must be depended on no further, and the cavity after it is partly filled with the felt must still offer a shape which will retain a filling. Your committee has looked into this thoroughly, and after long-continued use sufficient to acquire needed dexterity in manipulating the material asserts that if a tube were filled half with felt and half with gold, there would be little difficulty to separate them. As, however, the union is sufficient for working purposes, there are many cases where a great deal of time may be saved the operator and fatigue to the patient, if one-half or two-thirds of a cavity be filled with the felt. As it seems to contain asbestos (?) it is an excellent material to underlie either gold or amalgam where the pulp has been nearly approached by the caries.

Amalgam.—In spite of all that the gold adherents, and copper amalgam advocates may say, there remains still a vast number of teeth where a light colored serviceable amalgam is loudly called for. Immense proximal cavities in bicuspid teeth will continue to occur in the mouths of those who cannot afford a large fee for a crown or contour in gold. Copper amalgam from its color is not to be thought of. A method then of filling such cavities in a durable way so that the patient may afford the fee and the dentist the time is an important need. Such a method was advocated by your last committee, and has probably been but little appreciated or believed. Substantially it is as follows. The dam is to be placed, though that should precede every filling of every kind whenever possible. An amalgam known to be reliable, especially as to color, is mixed rather dry and the tooth filled. Very thin gold foil, thinner than what is known as No. 4, is annealed and cut into small strips, which are laid unfolded on the filling, and with perfectly clean warm burnishers (which should be kept specially for this purpose) burnished into the filling until it has set hard. It must be done thoroughly and sufficient gold used; sometimes a sheet or even two sheets will be required. The result is an ideal filling which will keep its edge, its color, and its finish. Your present committee not only has tested this in practice during the year,

but was allowed to inspect fillings made in this manner by the chairman of last year, where they had been in position two, three and four years. These fillings are so beautiful that those who see them for the first time involuntarily ask, "What amalgam is that?"

Treatment of Exposed Pulps.—This is a delicate subject because of the fact that there are many, high in the profession, of whose friendship your committee is proud, with whom, however, it is necessary to differ. A decade ago, or about that time, a movement in favor of pulp capping swept over our profession and took such a strong hold on our fellows that scarce one could be found with temerity to say a word contrary to the new method. What is worse, our young men were taught that almost any pulp which would bleed could be saved. So many failures, nevertheless, occurred from time to time, that unwilling to abandon the theory, men sought a remedy in new materials, till to-day our records would show that pulps have been capped with everything from tar to tooth-picks. Your committee could readily give forty or fifty different cappings. It seems time that some public word should be spoken aloud by an authoritative body to discountenance this, and to encourage those who, even now, have secretly abandoned the practice, to come forward openly and tell us what they are doing. We need a record of practice, not of theories. Ten years ago or more, when the death of a pulp meant the probable loss of the tooth, it was expedient to take every risk to save that little life, but to-day when the march of antisepsis has placed the wide-awake dentist almost beyond the danger of alveolar abscess, in the opinion of your committee it is almost as ill-advised to cap as it was then to kill. Your committee wishes it understood that the possibility of saving exposed pulps is not denied, even where amputation of a part has been resorted to; it is known that such success is possible—nay, even that the chances would altogether favor such an outcome *where the patient is in good general health*. But just there is the difficulty. Many exposed pulps are brought to us for treatment by persons with very ill-nourished bodies. Therefore, admitting the possibilities, your committee still decides against capping pulps, because the statistics undoubtedly show more failures than successes. If the exposed pulp be removed, and in the light of the antiseptic teaching of to-day the tooth-root be hygienically purified and filled, that tooth is safer than where a gold filling overlies a capping, giving the patient a fancied security which will not be disturbed, till in the dark hours of some night he is awakened to the truth with a fine specimen of an abscess as a companion. Your committee, however, deems it nearly always safe to cap *where the pulp has not been actually exposed*. In such cases where the tooth has ached a mild dressing of equal parts of creosote

and oil of cloves should be exhibited for twenty-four hours before capping, and a temporary gutta percha filling be placed for several days before final filling. If after such treatment the pulp gives no warning throbs, it would seem safe to fill permanently.

Root Filling.—The immediate root filling advocates have covered themselves with glory and are masters of the field. So far as abscess after filling is concerned, that has been already touched on in this report. Your committee has but to outline what seems the best method of filling the root. Perhaps the most commonly used filling material is gutta percha, and next in order is oxy-phosphate. Neither of these materials is as reliable as the profession think. At a meeting in Philadelphia this winter a gentleman exhibited the results of some experiments in this direction which were both instructive and important. He filled roots out of the mouth with gutta percha, and others with oxy-phosphate. Twenty-four hours later they were placed in aniline ink and left for one day. A segment-shaped section was removed and it was discovered that the ink had entered the dentine from the outside through the cementum, and from the inside by way of the canal, despite the fillings, which are generally thought to be water proof. A third specimen was where the root canal had been filled with cotton as a vehicle to carry carbolized cosmoline. The cosmoline had permeated the tubuli and thus prevented the ingress of the ink either from the outer surface or from within. Your committee does not think it advisable to use cotton as a root filling; nevertheless the above experiments teach the value of allowing a greasy filling to enter and carry with it a disinfectant. It therefore seems that the very best method is that introduced by Dr. Van Woert, which is to half fill the canal with a paste made of iodol, zinc oxide, and carbolized vaseline. By mixing these a paste can be formed stiff enough to render cotton unnecessary in its introduction. The upper half should be filled with oxy-phosphate, or better still oxy-chloride of zinc. In practice this has proven as good as it looks theoretically considered. All manner of teeth have been treated in this way, and the percentage of success is most encouraging. A great many men in New York and Brooklyn, in Boston and Philadelphia, have adopted this, and all report favorably.

Crowns.—This is a subject on which a book might be written; in fact, a book has been written and is already, within a year, in its second edition. Your committee wishes only to call attention to one or two comparatively new methods.

What is known as the *porcelain cusp crown*, is now offered by one of our manufacturers, and is an excellent method easily applied to many cases of molars and bicusps. A band of gold is fitted about

the root and the rubber dam is then applied. This is perhaps the only method by which we can be assured that the cement used is not reached by moisture. The dam in place, the adaptation of the band may be made accurate; the cement is introduced, and the cusp of porcelain which has one pin is then pressed into place, forming a most admirable crown.

All Gold Crowns.—All are familiar with the various methods of joining a cusp which has been swaged, to a band, producing an all gold crown. Although ready made dies and die plates may be had, the best results by this method are only had when special dies are made for each case. Even then, after great care, it will often occur that the crown is too long and it cannot be ground, as that would produce a hole through the cusp in many instances. Your committee therefore, where the "bite" is short, suggests the following method: After the band is fitted to the root, it is trimmed to mark the length of the bite; that is, it is made to occlude with the opposing tooth. Thin platinum is then burnished over the end of the root within the band, which is in place, and waxed to the band. This is carefully removed, invested, and loaded up with gold plate. The upper part being solid may readily be ground to make the occlusion accurate, and cusps formed with engine-burs. When finished it is all gold, no solder having been used except to unite the ends of the band (and that should be 20 carat), and thus a good color is secured.

Gold Tips.—A new method of making gold tips for abraded teeth has been introduced to the profession during the year by Dr. Van Woert. As this report is already long, however, it will be as well to say here that it is a most valuable addition to our resources, and that a full description of the method and instruments may be found in the *Cosmos*. The instruments are now in the market.

Bridgework.—This system of restoring lost teeth has come to stay. It, however, is still in its infancy, though a promising child and well worthy of being wedded to the dentist if he can only win her from her present parents, or rather "legal guardians." The weak point about bridgework is its strength. This is a paradox, but it is explainable. If a bridge be united to several roots, it becomes a most difficult matter to remove it. Such removal often involves the total destruction of the bridge. And such removal becomes necessary with our present methods whenever an accident occurs and one tooth is broken. If one tooth is broken on a gold plate it may be repaired at a trifling cost to the patient. Not so the bridge. If codes of ethics mean anything, then it is our duty to devise promptly some reliable system whereby bridges may be so made that repairs may be made inexpensively. It is not just to exact a large fee for a contrivance so made that the patient

is constantly in danger of losing its use or paying another large fee. Your committee was shown during the year a tooth invented by Dr. Wheeler, of Albany, which aims at remedying this trouble, and your committee recommends that a committee be appointed to examine into the merits of Dr. Wheeler's tooth, and if said committee report satisfactorily, that this Society recommend our manufacturers to arrange with Dr. Wheeler for the production of such teeth. A similar object is aimed at in a tooth invented by Dr. Perry, of New York. Your committee makes the same recommendation in regard to it.

Dentures.—In artificial dentures there are two comparatively new methods.

Aluminum.—This material has been shown together with the method of casting it, many times during the year. Your committee has met it at all the large meetings, and everywhere found dentists who had used it speaking in the highest terms of it. Undoubtedly, with good manipulation excellent dentures may be produced in this way. A special excellence is its use in regulating plates: points of attachment for ligatures, and places of resistance for jack-screws can be readily made without occupying much space, and screw threads may be cut through the plate itself through which screws may be made to act excellently well. Your committee has nothing but commendation to offer for this process.

Deposit Gold Plates.—Despite the fact that this method has been largely defended lately through the journals, it is the opinion of your committee that unless great improvements be made in this plate it will serve us but slightly. The advantage is that absolute adaptation is secured. The disadvantages are that the plates in many mouths discolor, and that every time any part is filed (to relieve some point of irritation, for example), the plate must be returned to the makers to be replated, as the silver becomes exposed. The plates cannot be soldered, that is they could not be as made a few months ago when your committee examined into the process. Where the teeth are attached with rubber the roughening of the surface as relied on is not sufficient to hold the rubber. Your committee expresses this opinion, although no such accident as the separation of rubber from these plates is known. Your committee, however, has learned by experience with gold plates, that a deeply graved surface of metal, and even holes punched through the plate is often inadequate, especially with pink rubber. Holes cannot be punched through the deposit plate as that would bring the rubber in contact with silver. Your committee in making this adverse criticism is not actuated by any but the friendliest feelings towards the company which makes these plates. Your committee has been well treated by them. These objections, however, are

pointed out that the company may be spurred on to overcoming them. The principle of making a plate by depositing metal is one which promises a great deal, and it is to be hoped that by next year a report may be made that the process has been perfected and all obstacles overcome.

Your committee wished to say something of therapeutics, but fears to make this report tediously long. It cannot refrain, however, from predicting that the time must come when the dentist will be a thorough physician, able to prescribe internal as well as to apply topical agents. It is to be hoped that the time is near, and that the knowledge of medicine which will be necessary to the proper practice of our profession will be offered by our colleges, and that a dental graduate will be the peer of the medical school man. Your committee has to report that this prophecy for the future is founded on a demand for such higher education which has been voiced by the leading societies all over the country. The colleges have already granted something and more is promised. It is "ask and have."

Your committee begs leave to submit its report.

A CASE OF OVARIOTOMY.

BY GEORGE WACKERHAGEN, M.D.

Read before the Brooklyn Surgical Society.

Mrs. H., a native of Norway, aged twenty-six, the mother of three children, noticed an enlargement of the abdomen in July, 1887. It gradually increased in size for three months, when it commenced to grow more rapidly. Her menses were regular. On consulting a physician, she was informed that she was pregnant, and that the hæmorrhage, which she had taken for a normal one, was caused by an abnormal location of the placenta. A consultation was then called, and it was determined to dilate the neck of the uterus with sponge tents, and in this way to bring on premature labor. This treatment was continued from day to day for a week, but without success, when Sister Elizabeth, of the Norwegian Hospital, Brooklyn, was requested by the patient's friends to visit her at her home in Hoboken.

On examination per vaginam, Sister Elizabeth came to the conclusion that the cervix and os uteri did not indicate pregnancy, but that the abdominal enlargement was probably due to an ovarian tumor. At the request of the husband, Mrs. H. was then removed to the Nor-

wegian Hospital, Brooklyn, where the diagnosis of ovarian tumor was confirmed by Drs. Turner and Westbrook. The patient came under my care for operation on the 26th of January. She gave a history of frequent attacks of malaria, and she informed me that on two occasions she had considerable difficulty in getting a movement of the bowels, and that as a last resort she had taken two tablespoonfuls of castor-oil, which had always relieved her if she waited patiently. I mention these facts, because I was somewhat influenced in my treatment of a complication in the case by these statements.

During the preparatory treatment and arrangements for the operation, the patient was cheerful and full of hope, prophesying a successful termination of her troubles.

Two days before the operation the bowels were thoroughly moved, and beef tea and peptonized milk only were given as nourishment. On the morning of the operation an enema of soap and water and asafetida was given, followed by a warm bath and a suppository of morphia, one-third grain.

I was ably assisted in the operation by Drs. Westbrook, Buckmaster, Turner and Anderson.

The patient having been anæsthetized, an incision about four and one-half inches long was made in the middle line of the abdomen, between the umbilicus and the symphysis pubis. Upon reaching the peritonæum, it was found to be adherent along the whole line of incision to the omentum, and this was adherent to the anterior wall of the tumor, which was very thin in this location. The tumor wall was accidentally nicked with the knife, causing a discharge of pus, some of which entered the abdominal cavity before it could be prevented. It was, however, quickly washed away with boro-salicylic solution. No other adhesions were found; the tumor was removed, and the pedicle tied with No. 12 silk ligature, the stump was cauterized and returned to the abdominal cavity. The abdominal cavity was thoroughly washed by using three gallons of boro-salicylic solution, and the wound closed. The cavity having been so carefully cleaned, it was not thought necessary to use a drainage tube. The intestines were scarcely seen during the operation.

The patient awoke from the anæsthesia cheerful and apparently with very little prostration. She complained, however, of some pain in the wound and vomited. A hypodermic of seven minims of morphia was administered, and the patient slept for an hour, and further vomiting was prevented by teaspoonful doses of hot water frequently administered. The nourishment consisted of small quantities of peptonized milk.

On the morning of the second day there was a slight rise of temperature, and increased rapidity of the pulse, which was, however, normal in other respects. She also complained of some discomfort from gaseous accumulation in the intestines; this was relieved by the rectal tube. The evening temperature was 101.2° and the pulse 134.

On the morning of the third day the temperature rose to 102.5 , pulse 124, respiration 20. She had been restless during the night, but did not complain of pain, and a hypodermic of one-quarter grain of morphia was given to allay restlessness. She seemed cheerful, but complained of thirst and want of nourishment; said she felt well and wanted something to eat. Attempts to administer anything by the mouth, except peptonized milk and small quantities of champagne, produced vomiting, therefore it was decided to give beef tea and teaspoonful doses of brandy by the rectum every four hours.

As the temperature seemed to be gradually rising, it was suspected that there might be some local peritonitis or that an intra-mural abscess was forming, though the patient stated that she was entirely free from pain and felt so well that she thought she could sit up in bed if she were allowed to do so. On examination of the abdomen no tympanites nor pain on pressure was found, and the wound had completely united under the antiseptic dressings.

Taking into consideration the statement of the patient that she had frequently been sick with malaria, it was decided to give, per rectum, ten grains of quinine every four hours. On the fourth day the temperature was 102.4 , pulse 126, respiration 18. She had some nausea during the day, and the same treatment was continued. At 9 P. M., temperature 102.6 , pulse 112, respiration 20. She was restless, but complained of no pain, and a small quantity of morphia was given hypodermically to produce sleep and allay nausea.

On the fifth day, at 9 A. M., the temperature was 101.5 , pulse 116, respiration 18. She still suffered from nausea, which was relieved by seven minims of morphia by hypodermic. She also complained of abdominal distension, which could not be relieved by the rectal tube, and an enema of turpentine, sweet oil, soap and water was given without success. Two drachms of sulphate of magnesia were administered, and were promptly vomited. This dose was repeated and retained, but produced no movement of the bowels. Examination per vaginam indicated nothing abnormal.

On the sixth day, at 8 A. M., the temperature was 102.8 , pulse 114, respiration 18. The tympanites was unrelieved and there was occasional pain from the gas changing its position. The enema of turpentine and oil was repeated, and was followed by the escape of considerable gas and a small lump of faecal matter, but the nausea continued

with occasional vomiting. Calomel, in one-tenth grain doses, was administered every hour during the day. The evening temperature was 102, pulse 126, respirations 18.

On the seventh day, at 8 A. M., the temperature was 103.2, pulse 126, respirations 18. She was less restless, but complained of occasional sharp pains in the umbilical region. The temperature had neither increased nor diminished. She expressed a desire for more nourishment by the mouth, saying that she felt that the bowels would move, and could not understand why we were so anxious to secure a movement, as she had been in the same condition several times before the operation. The enema was repeated and was followed by a very small evacuation of a dark liquid character, but after the injection the patient went into collapse, from which she recovered after hypodermics of brandy atropia and ammonia. Feeling sure that there was some abnormal obstruction, it was proposed to the patient, after she had rallied, to allow a reopening of the abdomen in order to relieve it, but she refused permission. In the afternoon the proposition was again made, and at the request of her husband, who was then present, she consented.

The preparations having been completed, the patient again went into collapse from which she had only partially recovered when the etherization was commenced. Her pulse, however, improved under ether, and by an occasional hypodermic of brandy, it was kept in moderately fair condition.

The abdominal cavity was reopened, Dr. Frank Rockwell kindly assisting. It was found necessary to enlarge the original incision, and also to puncture the large intestine, which was so greatly distended with gas that it was impossible to determine the seat of obstruction. This was found to be a volvulus of the large intestine and an adhesion of the tip of the vermiform appendix to the sigmoid flexure of the colon which was distended with gas and displaced to the right. Under this a portion of intestine had fallen and become constricted. There had been a slight amount of local peritonitis which was sufficient to cause adhesion of the end of an unusually long vermiform appendix. The volvulus was evidently secondary.

As soon as the adhesion was loosened the intestines resumed their normal position. The opening which was made in the large intestine was sewn up, the intestines returned to the abdominal cavity, and the wound closed, the patient, however, expired while the bandage was being applied.

I am of the opinion that had I administered the saline cathartic on the second day after the operation, these adhesions would not have formed, and the intestinal obstruction would have been prevented.

There had been no vomiting of fecal matter.

The tumor weighed $63\frac{1}{4}$ ounces, and was an ordinary multilocular ovarian cyst. Microscopical examination by Dr. Van Cott showed the cyst wall to consist of fibrous tissue, which contained in places myxomatous tissue. There were also areas of angiomatous tissue; the blood-vessels being simply dilated tortuous canals. In the fibrous stroma were seen, developing cysts, microscopic in size, lined with columnar epithelium. The contents of the cysts were seen to be composed of a large number of leucocytes, red blood corpuscles, columnar epithelia, large spherical cells, granular, and many containing fat, corresponding to Drysdale's corpuscles; granular detritus, leucin and fibrin in filaments.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

NEW YORK PHYSICIANS' MUTUAL AID ASSOCIATION.

The twentieth annual report of this admirable organization is most encouraging. Sixty-four new members have been added to the list which now numbers five hundred and five physicians. The President expects that this will be increased to one thousand.

We regard the work of this association as of such importance that we desire to bring before the profession in as prominent a manner as possible its objects and aims, and we believe that we can do it in no better way than by quoting the language of its President, Daniel Lewis, M.D. He says that the important interests which are confided to the Trustees are three-fold and characteristic of this association :

“First in importance should be mentioned the payment of a sum amply sufficient for present needs to the family of a deceased member, immediately after the death has been announced and the proper proofs submitted. No insurance company pays such claims until after a period of several weeks, and often three months. Thus even this feature of immediate payment establishes the benevolent rather than the business character of our organization—a fact which many beneficiaries can attest; for in the comparatively short life of this society we have paid \$50,000 to such claimants.

“It seems to me proper to say in this connection, that while every member is entitled to this benefit for his family, it would be a great boon to our other classes of beneficiaries if those of us whose families are fairly provided for should designate by will, or otherwise, that their interest should go to the permanent fund, where their benevolent act may be extended to the professional brother who is needy as long as the association lives to continue its work.

“Next in importance to the death claim is the provision of our by-laws, whereby a member who is sick or in distress may receive from us a loan nearly equal to his interest in the assessment fund.

“He pays no interest and no principal unless he becomes able to do so, the entire claim being adjusted after death. No such beneficent provision exists for medical—or any other class of men—in any other society, as far as I know. It is this feature which make our membership of great value to the younger members of our profession.

"The third feature of our work depends upon the interest of the permanent fund alone, and is not as satisfactory as it should be.

"We have been enabled to furnish aid to some widows and orphans of deceased members, beyond the death claim, but the lack of funds limits us in this direction. If all of you appreciated this fact as your trustees have done, when obliged to decline aiding the widow and fatherless, these contributions could easily be obtained from the benevolent of our members as well as from the laity. It is neither fair nor creditable that the widows and orphans of a medical man should be allowed to become a public charge. It is our business to take care of them."

Of the five hundred and five members, one hundred and thirteen are Brooklyn physicians. This proportion should be greatly increased, and for their own benefit and for the reputation of the profession we would urge every physician of Brooklyn who is not already a member to send an application to Dr. W. W. Reese, the efficient 1st Vice-President of the association.

IMPURE DRUGS.

The report of Willis G. Tucker, M.D., Ph.D., Analyst of Drugs to the State Board of Health, is both suggestive and instructive. It contains the results of nine months of work, during which time three hundred and twenty-six samples of drugs and pharmaceutical chemicals and preparations have been collected and examined. Fifty-three samples of purified chloroform were examined; thirty-nine of these were of good quality, ten were fair, and four inferior. The same number of samples of stronger ether was examined; twenty were of good quality, five were fair, twenty-six were inferior, and two were not as called for, one of them being spirits of nitrous ether, and the other the so-called "Concentrated Nitrous Ether." The former of these was dispensed unlabeled, and the second was labeled "U. S. P. Stronger Ether" by the seller. In commenting on the result of the ether examination, Dr. Tucker well says:

"Such errors as these are the grossest of blunders, and the consequence of such ignorant or careless sales might be most serious to the purchaser. Stronger ether being generally used as an anæsthetic ought to be of good quality; but from these results it will be seen that an inferior article is often, indeed in the majority of cases, offered for sale. Stronger ether having been called for in writing in each case, the substitution of common ether is entirely inexcusable and shows great carelessness or ignorance."

It is gratifying to learn that such excellent work is being done by our State Board and that it is proposed to continue it. Dr. Tucker states that the work done during the past two years has had a decided effect in improving the quality of the drugs sold throughout the State, and expresses the opinion that if manufacturers, dealers and others interested will co-operate with the Board in the efforts it is making to raise the standard of the drugs and medicinal preparations now upon the market, the desired end can be attained without interfering with any legitimate business industry, or embarrassing dealers by a too rigid or oppressive enforcement of the law.

THE NEW CONTAGIOUS DISEASE HOSPITAL.

We learn from the *Eagle* that Health Commissioner Griffin appeared recently before the members of the Committee on Public Health to impress upon them the necessity for prompt action in order to secure the erection of the much needed pavilions for the treatment of contagious diseases. He found that the Aldermen appreciated the importance of the matter and were ready to assist the Health Commissioner without debating the matter. The resolution which brought the matter before the committee was introduced by Alderman Beard at the last meeting of the Board of Aldermen and is as follows :

Resolved, That the Commissioner of City Works be and is hereby directed to prepare plans and specifications for the erection of the necessary buildings for the reception and treatment of persons suffering from infectious and contagious diseases in the order in which they shall be needed, upon the site purchased by the city for that purpose, and when said plans and specifications are so prepared, to advertise for proposals thereon, and award contract or contracts therefor, provided the cost thereof does not exceed in the aggregate the sum of \$50,000.

No one appeared in opposition to the matter, and on the suggestion of Alderman Coffey the committee decided to report favorably on it at the next meeting of the Board.

Health Commissioner Griffin, after the meeting of the committee, said it is intended to erect temporary pavilions without delay. The site selected for these pavilions is located on the unimproved property between the city line and the County Buildings. They will occupy the blocks bounded by Tulip, Fenimore and Hawthorne streets, in Flatbush, and Albany and Kingston avenues. These streets are so designated in the map but none of them is open.

The residents of the Town of Flatbush strenuously oppose the location of a contagious disease hospital within the town limits and will resort to the court to prevent the building of the proposed pavilions. Health Commissioner Griffin is of the opinion that the courts will not interfere and expects to have the pavilions ready for the reception of patients before summer.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

A regular monthly meeting of the Medical Society of the County of Kings was held at the rooms of the Society, 356 Bridge Street, May 21st, 1889, at 8 o'clock.

The President, A. Ross Matheson, in the chair; W. M. Hutchinson, Secretary. There were about seventy-five members present.

The minutes of the April meeting were read and approved. The Council reported favorably upon the applications of Drs. H. B. Delatour and Harry Kent Bell.

The President declared the following named gentlemen elected to membership: Drs. L. W. Pearson, Eugene F. Pearce, J. H. E. Sands, Victor A. Robertson, Harvey L. Grover, S. G. Clark, Jeremiah Koehl, and Robert A. Black.

The following were proposed for membership: Dr. Wm. H. Skene, 167 Clinton St., L. I. C. H., 1888, by Dr. Raymond, endorsed by Dr. Hutchinson; Dr. Alexander Rae, 20 Clinton St., L. I. C. H., 1885, by Dr. E. A. Lewis, seconded by Dr. Palmer; and Dr. Francis E. Wilson, Wierfield St. and Bushwick Ave., by Dr. Matheson, seconded by Dr. Chase.

SCIENTIFIC BUSINESS.

The following papers were read: "A New Inhaler—Sulphuric Ether as an Anæsthetic," by J. H. Hobart Burge, M.D.; "Abscesses of the Frontal Sinus," by Lewis S. Pilcher, M.D.; "Some Observations upon the Climate of Colorado," by Hubert Arrowsmith, M.D.

The discussion that ensued was participated in by Drs. Dickinson, Raymond, Mathewson, Prout, Westbrook, Jeffrey, Fox, and others.

NEW BUSINESS.

Dr. Raymond offered these resolutions:

WHEREAS, the medical expert witness is at the present time held in less repute than formerly, and his opinions have lost much of their force with both judge and jury; and,

WHEREAS, such diminished respect for the medical witness tends to injure the profession as a whole and to lessen its influence; and,

WHEREAS, it seems probable that the status of medical expert testimony may be improved by united and harmonious action of the profession looking toward that end:

RESOLVED, that it is the sense of this society that it is derogatory to the best interest of the medical profession for any of its members to occupy in a legal trial the position of medical adviser to counsel and witness in the case ;

RESOLVED, that it is the sense of this Society that the physicians who are called upon to give evidence in legal cases, with reference to the existing physical condition of patients, should insist, if it be possible, upon meeting in consultation the physicians to be called by the other side, so that there may be a full interchange of views before they testify.

On motion of Dr. Kretschmar it was voted to postpone the consideration of these resolutions until the June meeting of the Society, that they be printed upon the notice of that meeting, and that the Council be requested to invite representatives of the legal profession to be present and participate in the discussion.

The President pronounced a short eulogy upon the late Dr. Frank W. Rockwell, and appointed as a committee to prepare an obituary notice, Drs. Pilcher, French, and Griffiths.

There being no further business, on motion the meeting adjourned.

W. M. HUTCHINSON,
Secretary.

NEW BOOKS AND BOOK NOTICES.

THE DIAGNOSIS AND TREATMENT OF EXTRA-UTERINE PREGNANCY. By John Strahan, M.D., M.Ch., M.A.O., Belfast, Ireland. P. Blakiston, Son & Co., Philadelphia, 1889.

This monograph is conspicuous as the first Jenks prize essay of the College of Physicians of Philadelphia. Of seven competing essays on the subject of extra-uterine pregnancy this one was designated by the Committee of the College to receive the award. In addition to the prize it was still further honored with the special commendation of the Committee. The book, however, we are constrained to say, is little more than a reiteration of the views of Mr. Tait, whose acknowledged genius and unequalled opportunities for observation in this department, the author justly thinks, should give great weight to his opinions. It is to be regretted that it lacks the clear and incisive style of that writer, and is occasionally marred by crude and inaccurate methods of statement. Nevertheless it will be read with interest by those who are not already familiar with the recently published "Lectures" of the Birmingham surgeon. At all events the distinguished endorsement it has received is significant of the tendency of professional opinion upon the much discussed topic of extra-uterine foetation. We venture, therefore, to submit a brief notice of its contents.

As an essential preliminary to the discussion of diagnosis and treatment, the author briefly reviews the pathology of extra-uterine pregnancy. Here, as upon

most points, he commits himself fully to the teachings of Mr. Tait. Upon certain questions of diagnosis and treatment, however, he grants, that authority has, perhaps, been too dogmatic.

According to Tait, all extra-uterine pregnancies are primarily tubal. Of the seventy-nine ectopic gestations seen by him, seventy-eight were primarily in the free part of the tube, one in the interstitial.

1. Pregnancy in the free portion of the tube ruptures at or before the fourteenth week. The seat of placental attachment becomes the weakest part of the tube; hence, according to the location of the placenta the rupture takes place into

(a) The peritonæum.

(b) The folds of the broad ligament.

Intra-peritoneal rupture is uniformly fatal without the intervention of surgery, primarily by hæmorrhage, secondarily by suppuration of the ruptured sac and peritonitis.

A broad ligament pregnancy may develop to full term; may die and be absorbed as extra-peritoneal hæmatocele; may die and suppurate; may remain quiescent as a lithopædion; may become intra-peritoneal by secondary rupture.

2. Pregnancy in the interstitial portion of the tube is uniformly fatal by rupture into the peritonæum before the fifth month.

Hart and Carter have confirmed Tait's theory of misplaced pregnancy from frozen sections of two cases. They also confirm what Tait has taught for several years, that in intraligamentous pregnancy, as the ovum grows, the peritonæum is stripped off the back of the uterus and a part of the walls of the pelvis and abdomen, leaving a narrow pouch of peritonæum undetached which extends down between the abdominal wall and uterus in front.

Primary abdominal or ovarian pregnancy has not yet been accurately proven.

Abdominal pregnancy is possible as the rare result of secondary rupture, as in Mr. Jessop's case, the only reliable one on record. [Even this Mr. Tait thinks doubtful.]

The general subject of diagnosis and treatment is discussed under numerous subdivisions. Regarding the question of diagnosis before rupture Tait goes too far. His belief, that diagnosis is practically out of the question at this time, is refuted by many recorded cases in which the diagnosis has been verified by operation or by post-mortem section. [Witness the seven cases operated before rupture by D. Veit of Berlin, in which the diagnosis was made before opening the abdomen, and many others reported by American surgeons.] The fact, however, remains that in a vast proportion of instances either the case does not present for examination till rupture occurs or, the menses going on, the theory of pregnancy is dismissed. If we could arrange the circumstances the diagnosis would generally be possible. Yet "the principal advance in our knowledge of recent years in this department, viz., diagnosis of extra-uterine pregnancy before rupture, seems to be, that we know now that there may be no symptoms whatever, no thought of pregnancy in the patient's mind, no arrest of menstruation, no pain, and if sympathetic symptoms of pregnancy are always present they may be so slight as not to arrest the patient's attention." Contrary to the generally accepted opinion the menses afford little aid in the differential diagnosis between normal and ectopic pregnancy, since the facts differ so much in different cases. One valuable diagnostic point, often overlooked, is the open condition of the cervix which is sooner or later present in all cases of ectopic gestation. The bimanual and the fluctuation tests show the uterus to be empty without the use of the sound.

Interstitial pregnancy must be very rare. Of the seventy-nine cases of misplaced pregnancy seen by Tait but one was of this variety. In his opinion the diagnosis of interstitial pregnancy from normal gestation is absolutely impossible before rupture.

The diagnosis of extra-uterine pregnancy after rupture is frequently not difficult. Pain and hæmorrhage generally precede rupture. When the growth of the ovum exceeds the accommodating growth, painful muscular spasm occurs in the overstretched sac, the ovum is partially detached and blood escapes by the uterus. This process may occur several times before rupture. The tube bursts before the fourteenth week when the ovum is lodged in the free portion of the tube, from the third to the twentieth in the interstitial.

Intraperitoneal rupture almost without exception results in fatal hæmorrhage. The case can nearly always be diagnosed as an abdominal hæmorrhage and an intraperitoneal hæmatocele, not referable to external violence, is almost without exception due to a ruptured gestation sac. In this class of cases the diagnosis is easy after rupture, not so plain in extraperitoneal rupture. Extraperitoneal hæmatocele may arise from many other causes. The essential diagnostic point between the two forms of rupture is the fact that the blood forms a circumscribed tumor in the broad ligament, but gives rise to no defined tumor when in the peritoneal cavity.

Between hæmatocele from rupture of a tubal pregnancy into the broad ligament and hæmatocele from other causes, there is no diagnostic distinction if the ovum be dead. While the ovum lives the signs of pregnancy may serve to differentiate. After the viable period the case is usually clear. After the foetal heart tones are available there is no possible source of error if the uterus be empty. With excessive thinning of the abdominal and uterine walls, however, advanced uterogestation may simulate extra-uterine pregnancy.

At the full period of gestation, spurious labor is the invariable rule. Secondary rupture may occur at this time usually with a fatal result unless the surgeon steps in. Lactation is frequently established for a time.

Pregnancy in one horn of a double uterus, like interstitial pregnancy, must often be impossible of identification, even at the most skilful hands. Yet pregnancy in a very undeveloped horn is practically extra-uterine, and will end in rupture just as tubal cases do.

After the full period of pregnancy and the foetal death is the most difficult time of all in which to make the diagnosis. The uterine souffle disappears shortly after the foetal heart sound. In a case observed by Dr. Petch it persisted for fourteen days after the foetal death. The shape of the child is so much altered when the liquor amnii begins to be absorbed that it affords no aid. Some reliance may be placed upon the history of pregnancy, of false labor, a show of blood during the false labor and a decrease of size thereafter, yet histories alone are not to be trusted. Hæmorrhage at false labor and the diminution in size of the tumor afterwards, Tait says, are constant. The uterus is always intimately connected with the tumor, most often in front of it. The uterus when the placenta is on the back of it is always enlarged until the placenta begins to be absorbed and the cervix is always more or less open. The gestation sac is often ruptured by the contraction of the abdominal muscles during spurious labor and with a rapidly fatal result unless the surgeon interferes. Very rarely the child has been known to live several months after term. Dermoid cysts and cancer are the conditions most frequently mistaken for a dead extra-uterine foetus.

To understand the pelvic abscess resulting from suppuration in an extra-

uterine gestation sac, it must be remembered that all ova that survive rupture are almost certain to be situated in the broad ligament. The avenues of escape for the fetal debris in these cases are in the order of frequency as follows: Most frequently by the rectum, next the posterior vaginal cul-de-sac, occasionally through the bladder and most rarely through the abdominal wall near the umbilicus. Cases are recorded in which the extrusion has taken place by the colon or intestine and even through the uterus. The vaginal fistula is least dangerous, the vesical the most so, owing to cystitis and the possibility of surgical kidney. The case is not distinguishable from other forms of pelvic abscess if the fetus die early. If the pregnancy has gone nearly to term, the history will afford material help, but diagnosis is generally impossible till fetal bones appear in the discharge. Exploratory incision affords the means of both diagnosis and cure.

Under the head of differential diagnosis the author cites the following list of conditions liable to be mistaken for extra-uterine pregnancy, as given by Prof. Thorburn:

1. Intra-uterine pregnancy.
2. Normal pregnancy with retroversion or retroflexion.
3. Pregnancy in one cornu of a bifid uterus.
4. Ovarian tumor.
5. Cyst of broad ligament.
6. Fallopian distension.
7. Uterine tumors.
8. Pelvic hæmatocele (simple).
9. Pelvic inflammatory exudations or abscesses (simple).
10. Cancer of pelvis or peritonæum.

Skill in the bimanual examination and a careful mental survey of all the possibilities in the case are the chief means of success in the differential diagnosis. Repeated examination may frequently be necessary. Most unreliable are the history of extra-uterine pregnancy and usually the form of the tumor. With the best of skill and care, differentiation is in many cases impossible before the abdomen is opened.

The treatment of extra-uterine pregnancy is discussed under three principal heads:

First, treatment before and directly after rupture.

Second, treatment between rupture and full term and the fetal death.

Third, treatment after the death of the fetus.

In the treatment of the first class of cases, as in the pathology of misplaced pregnancy, a complete revolution has taken place in the last five years. To Tait belongs the credit of inaugurating the new practice in 1883, though it had been proposed many times before by other writers [e. g., by Dr. Stephen Rogers in 1867; by Heim, Os'ander, Josephi, Zang, and others.]

The treatment of extra-uterine pregnancy before rupture should a diagnosis be made, is laparotomy. Electricity and all other methods of fœticide are to be condemned.

That the death of the ovum may cause efforts at expulsion as it does in intra-uterine pregnancy and thus bring about the rupture which the treatment aims to prevent he considers as yet not proven. Under peculiar circumstances he thinks it may. Any treatment for the prurupture stage, however, is of limited advantage, since in the vast majority of cases the rupture itself is the first warning of anything amiss.

That the placenta may in some cases continue to grow for a time after the death of the fetus has been abundantly shown. [There is no evidence, however,

that it does so after fœticide by electricity.] In any event the danger persists after killing the fœtus in the advanced stages of pregnancy. In the very early stages absorption may as a rule be expected from the analogy of certain intra-ligamentous cases with dead fœtus. In many of these cases ovum and blood are alike absorbed. With reference to the argument that there is neither certainty nor safety in any of the methods of fœticide, he remarks, "that is confessed by their advocates." This argument is true of puncture for whatever purpose. Puncture, as Tait says, it is quite as dangerous as abdominal section. Parry declares that few women have long survived it. [It certainly is not true of electricity in early pregnancy without puncture. In the prerupture stage and up to the fourth month the American record of electricity without puncture has not been surpassed in certainty or safety by the results of section].

As regards the possibility of fœticide by electricity without puncture, the author thinks more cases and far more conclusive cases, as to diagnosis, are required before we can admit the claims of either the galvanic or the faradic method. He dwells upon the dangers of the electrical treatment, but does not clearly distinguish between electricity with and without puncture. Moreover his comparison of electricity with laparotomy is based almost wholly on the remarkable statistics of Tait and not upon the probable results of the latter operation at the hands of the profession at large.

Elytrotomy is much more difficult than abdominal section and cannot possibly give better results.

As to the treatment at the period of primary rupture there can be no difference of opinion. The importance of early operation is obvious. Every hour of delay diminishes the chances of recovery. "The resources of surgery, as Lusk has said, are rarely successful when practised on the dying." Should collapse be so extreme as to forbid immediate operation when the patient is first seen, something may be done by way of resuscitation before resorting to the knife. Pressure may be made upon the abdominal aorta, as suggested by Playfair, to prevent further hæmorrhage. An intravenous saline injection may do important service. For this purpose the following solution is recommended: Common salt, 6 grammes; liquor potass., 1 minim; pure carbonate of potass., 3 grammes; water (boiled or distilled) 1,000 grammes; heat to 40 deg. C., and pour through a funnel from a height of 1 metre. A most potent restorative in conditions of apparent death is nitro-glycerine in hypodermic doses of ten minims of a one per cent. solution. Atropine should be injected as soon as the effects of the nitro-glycerine are apparent. This treatment, it may be remarked in passing, is equally useful in collapse from other causes than hæmorrhage, in apparent death from drowning and even in still-born children.

The method of operation is next described. Incomplete or uncertain diagnosis should not deter the operator. The diagnosis must often await the section. The operation is done to arrest intraperitoneal hæmorrhage, which is usually due to ruptured tube.

Cases which survive primary or tubal rupture are according to Tait almost without exception cases of rupture into the folds of the broad ligament.

For the treatment between the primary rupture and the viable age we have but two alternatives, expectancy and laparotomy. Should symptoms arise putting the mother's life in danger, incision is safer than any other kind of interference. In the event of "abdominal collapse," as Barnes terms it, or of pelvic abscess the abdomen should be opened. In the absence of symptoms endangering the mother's life, the case should be let alone till term. The child should have a chance for its life, since while the child lives no interference is demanded in the interest of the mother before the full period.

At the full period of gestation the author gives preference to the primary operation, laparotomy at term. The onset of labor is the most favorable time for both mother and child. He thinks the statistical comparison of the primary and secondary laparotomy misleading, since the comparison takes no account of the numbers who have died while waiting for the secondary operation. Moreover the primary has gained most by modern surgical progress. Several pages are devoted to the technique of the primary operation. The incision should be made two or three inches to the side of the mesial line in order to avoid the tube-like process of peritonæum which extends from each side of the fundus uteri to the base of the bladder. The operation may thus be made extra-peritoneal. The history and physical signs will show on which side the fruit sac lies. An important point in the operation is Tait's method of dealing with the placenta. The cord is cut off close to the placenta, the foetal portion of the placenta emptied of blood as far as possible by careful pressure, the sac is cleansed and washed out with water by means of a siphon trocar and the stitches drawn tight with the trocar still in the wound. The water is then pressed out of the sac through the trocar, the trocar taken out with precautions against admission of air, and the wound totally closed. This method of treating the placenta promises to be a great advance on any previously tried, and Tait says he has tried them all. Yet it is often possible to tie a pedicle with the main vessels in it. In such cases ligation should always be practised and the placenta removed. When it is much spread out upon various structures and is so intimately adherent that it can be removed only with great difficulty and hæmorrhage, it is more prudent to leave it. [Breisky's experience leads him to think the total removal of the gestation sac is practicable in all cases.] By hermetically sealing up the placenta in the manner above described he believes he can in nearly all cases avoid decomposition and suppuration and all further trouble. The placenta is almost surely absorbed in this method of operation. [Why not, then, a three months ovum killed by electricity?] Tait practically converts the primary into a secondary laparotomy, getting the advantages of each and escaping the drawbacks of both. The sac may be reopened should sepsis develop. Secondary removal of the placenta would probably be both easy and safe after thrombosis of the maternal sinuses. If the operator unfortunately opens the peritonæum he may stitch the edges of the cyst to the edges of the abdominal wound, and then proceed as in the extra-peritoneal operation.

Attachment of the placenta to the abdominal wall over the line of incision would complicate the operation, but this, the author believes, despite authorities to the contrary, is a very rare site. After the death of the foetus its early removal is imperative. An expectant policy in these days would be almost criminal. A woman is never free from danger while carrying a dead ectopic foetus. If interstitial pregnancy could be diagnosed before rupture, the treatment would be dilatation of the cervix, division of the septum in the wall of the uterus, and evacuation of the pregnant cornu.

Vaginal extraction of an ectopic foetus is a more dangerous operation than abdominal section. One thing that conduces to the danger is the fact that the insertion of the placenta is generally pelvic, so that it would be involved in the incision, and worse than this the child must be dragged through the highly vascular placental site.

CHAS. JEWETT.

THE INTERNATIONAL MEDICAL ANNUAL AND PRACTITIONER'S INDEX :
a Work of Reference for Medical Practitioners. E. B. Treat &
Co. N. Y., 1889. Price, \$2.75.

The enterprising publishers of Treat's Medical Classics have added to their list this publication, which has had a prosperous career of seven years in Great Britain, and is now brought out simultaneously in this country in style to correspond with the other volumes of the Medical Classics. To the list of able British editors, among whom we notice such men as R. S. Fancourt Barnes, W. H. Elam, Sir Morell Mackenzie, J. W. Taylor and others, have been added the names of three of our New York men, viz., Hy. Dwight Chapin, who writes the articles on Children's Diseases; Chas. L. Dana, who is responsible for the Notes on Nervous Diseases; and James R. Leaming, who furnishes those on the Heart and Circulation.

The first part of the Annual is devoted to the subject of New Remedies, under which title they include not only drugs which have come under notice during the past year, but all new information about old drugs which the year's investigations have developed, recognizing the fact that a new remedy is not necessarily a new drug, as Percy Wilde sagely remarks in describing a new property in *cannabis indica*, that of increasing the appetite when impaired as the result of exhausting diseases. In such cases he has found *tr. cannab. ind.*, $\text{℥} 5-10$, given half an hour before meals, most valuable.

When we see that the author finds no less than ninety-four drugs to describe as new remedies, or new applications of old remedies, we realize the value of an annual summary, condensed within seventy-one pages.

Dr. T. Strutch Dowse, M.R.C.S. Phys., North London Hospital for Consumptives, etc., gives us a chapter on Mechanico-Therapeutics, or the practical application of *massage* in disease, and the "Weir-Mitchell treatment." This is illustrated with eight woodcuts, showing the various methods of applying the massage to the various parts of the body.

Electro-Therapeutics is treated of under its various forms of static and galvanic electricity and faradization, giving descriptions with illustrations of various batteries, electrodes and other apparatus, together with general rules for its application in its various forms of application in a special index of diseases. Electro-Surgery, including electrolysis, giving Apostoli's treatment of uterine fibroids, and galvano-cauterization receive special notice; while the two pages devoted to the bibliography of the subject are by no means the least valuable.

The remainder of the volume is devoted to new treatments, or, as styled by the editor, a Dictionary of New Treatment in Medicine and Surgery, 1889.

The different diseases, etc., are arranged in alphabetical order, beginning with abdominal injuries and ending with yellow fever. and it is said an account is given of every new point in respect to treatment which has been afforded by the literature of the world during the past year.

As a supplement the volume gives us a list of the principal medical works published during the past year—chiefly American—and a list of private asylums and homes for the insane, feeble-minded and inebriate.

THE AMERICAN ARMAMENTARIUM CHIRURGICUM. George Tiemann & Co.,
New York, 1889.

This is a new, revised and greatly enlarged edition of Tiemann's Illustrated Catalogue and Price-List. It is an entirely new work, differing very materially from former editions, both as to shape, size and arrangement of contents. A carefully-

prepared, a phabetically-arranged index and price-list combined gives location of engraving and price of instrument at once glance. A large number of operations are described in full, and brief descriptions of the anatomy of the parts to be operated upon are also given.

This imperial octavo volume contains 862 pages, and is profusely illustrated with over 3,400 first class wood-engravings, is printed in the best manner on extra quality velvet-finish paper and provided with a handsome and substantial binding: the object of the publisher being to produce a work which shall not only serve as a price-list, but shall also be a book that the surgeon will find valuable and worthy of a place in his library.

Unlike most catalogues, this does not contain a single advertisement—the expense being borne exclusively by Messrs. Tiemann & Co.

Every surgeon and physician is entitled to one copy of this work upon payment of one dollar for cost of binding; additional copies may be obtained at five dollars each. In order to avoid unnecessary bookkeeping, it is requested that applicants, without exception, remit the amount with order.

The Armamentarium weighs 104 ounces, and, if ordered to be sent by mail, 52 cents per copy must be added for postage; otherwise it will be forwarded by express, which will be the cheapest in most cases.

This is a most valuable book, and should be in the possession of every physician as a book of reference. Instruments which are constantly referred to in text-books and medical journals, but are not figured, are not only illustrated in this volume, but are described. The expense of its publication must have been very great, and the labor of preparing it herculean; and the profession should show its appreciation of this contribution to medical literature by accepting the generous offer of its publishers, to send it to any physician for one dollar, an amount which hardly pays for its binding.

HOME GYMNASTICS FOR THE WELL AND THE SICK, adapted to all ages and both sexes. With direction how to preserve and increase health; also how to overcome conditions of ill health by simple movements of the body. Edited by E. Angerstein, M.D., Staff Physician and Superintendent of the Gymnasiums of the City of Berlin, and by G. Eckler, Head Teacher of the Royal Institution for training teachers of gymnastics. With many wood-cuts and a figure plate. Translated from the eighth German edition. Boston and New York: Houghton, Mifflin & Company, 1889.

The title of this book tells in a very concise way the object of its publication, and a most praiseworthy object it is. We know of no work which covers just the ground that this one does, and certainly none covers it more completely or more satisfactorily. The editors are both men of experience, and they have succeeded in putting into as concise a form as possible the result of their years of teaching and observation. Much of the value which the book possesses is doubtless due to the fact that one of its editors is a physician. In that portion which treats of the application of gymnastic exercise to invalids, we find methods described which are adapted to those suffering from debility, constipation, corpulence, asthma, abnormalities in the carriage of the body, lateral curvature of the spine, muscular weakness, writer's cramp, etc.; in fact in every form of diseased condition in which exercise could possibly have any remedial action. The text is well illustrated, and the type and paper are of the best. "Home Gymnastics" is a book

which should be in every family; it deals with a subject in which every parent should be informed, and describes methods of exercise which are practicable without any expensive apparatus, and in so clear and concise a manner that no teacher is needed. There are suggestions given in its pages which will aid the physician to overcome deformities and correct departures from health without the use of complicated apparatus or drugs of any kind.

A PRACTICAL TREATISE ON THE DISEASES OF THE HAIR AND SCALP.

By George Thomas Jackson, Instructor in Dermatology in the N. Y. Polyclinic, etc. 16mo, c., ill. E. B. Treat & Co., 771 Broadway, N. Y., 1887. Price, \$2.75.

We quote from the author's preface: "The aim of this book is to present to the medical profession a concise statement of what is known of the diseases of the hair and scalp, special attention being given to their diagnosis and treatment. To this end a great number of medical journals have been consulted and all available books upon the hair have been read."

The author devotes the first fifty pages to the consideration of the anatomy, physiology and hygiene of the hair, drawing liberally upon the writings of Waldeyer and Unna.

The remainder of the work is divided into Part II., Essential Diseases of the Hair; Part III., Parasitic Diseases of the Hair; and Part IV., Diseases of the Hair secondary to Diseases of the Skin. An exceedingly valuable part of the work is the full bibliography, giving no less than 640 references, not only to books which deal solely with the hair, and general treatises upon the skin, but also to the great mass of journal literature on the subject which the past twenty-five years has produced.

The volume is neatly gotten up, quite fully illustrated, and is one of the series of Treat's Medical Classics.

THE TONGUE IN DIAGNOSIS. By C. Coleman Benson, M.D. Second edition.

This chart contains a "map of the tongue," which the author claims defines the seats of relationship to the various organs of the body, and places before the observer at a glance the condition of any of those organs indicated upon it. The chart also gives the indications of various states and colors of the tongue.

It seems to us that the author claims more for his "map" than can be actually fulfilled. We should hardly expect to find any relationship existing between the tongue and the pleura, or the tongue and the brain and spinal meninges, as indicated in the chart, and yet we are not prepared to deny it. The subject is one which is well worth the attention of physicians; and as the price of the chart is but fifty-five cents, its purchase may prove a profitable investment, and certainly could not embarrass one financially.

ON CORPULENCE, ESPECIALLY ITS TREATMENT BY A PURE MILK DIET.

By George H. Rohé, M.D., of Baltimore, Md. 8vo pamph. Reprint from Md. Med. Jour. of February 9, 1889.

The author concludes as follows: While I am firmly convinced that the only true physiological way of reducing excessive fat is to burn it up by active exercise, I fully recognize the impracticability or inexpediency of enforcing this rational regimen in some cases. In such, no more satisfactory method of treating this often annoying condition is available than a pure milk diet, which I earnestly commend to your attention.

EIGHTEENTH ANNUAL REPORT OF ST. CATHERINE'S HOSPITAL, BUSHWICK AVENUE, BROOKLYN, E. D. In charge of the Sisters of St. Dominick, Dec. 1, 1887, to Nov. 30, 1888.

During the twelve months included in the report they have admitted 2,319 patients ; of these they have

Discharged cured.....	1244
“ improved.....	552
“ not improved.....	55
Died.....	301
Transferred.....	12
Remaining	155

REPORT OF THE BOARD OF ADMINISTRATORS OF THE CHARITY HOSPITAL TO THE GENERAL ASSEMBLY OF THE STATE OF LOUISIANA. New Orleans, 1887.

This is one of the most venerable hospitals in the country, as the marble tablet in the main hall of the hospital records that the Charity Hospital of Louisiana was founded in 1786 by Don Andres Almonaster y Roxas, etc.

The present buildings were erected in 1832, since which time they have sheltered for treatment 432,187 patients. The mortality during that time has been 14.65 per cent.

THE QUESTION OF INTERFERING WITH THE ABSCESSSES OF HIP DISEASE.

By A. B. Judson, M.D. 12mo pamph., pp. 8. Reprint from N. Y. Med. Jour., March 2, 1889.

A contribution to the discussion between the general surgeon whose reliance is chiefly on operative procedures and the orthopædic surgeon whose reliance is chiefly on mechanical means.

A DEFENCE OF ELECTROLYSIS IN URETHRAL STRICTURES WITH DOCUMENTARY EVIDENCE. By Robt.ⁿ Newman, M.D. 16mo pamph., pp. 20. Reprint from Medical Register, January 5, 1889.

SUCCESS AND FAILURE OF ELECTROLYSIS IN URETHRAL STRICTURES ESPECIALLY REVIEWED. By Robert Newman, M.D. 16mo pamph., pp. 36. Reprint from Phila. Med. Times, December 15, 1888.

COOPER MEDICAL COLLEGE, SAN FRANCISCO, ANNUAL ANNOUNCEMENT, SESSION OF 1889.

ANNUAL REPORT OF MORSE DISPENSARY OF COOPER MEDICAL COLLEGE FOR 1888. San Francisco, 1889.

CORRESPONDENCE.

SULPHUR FUMIGATION.

NEW YORK CITY, April 9th, 1889.

To the Editor of THE BROOKLYN MEDICAL JOURNAL :

The medical faculty can scarcely blame ordinary mortals for holding their minds in a solution of doubt as to whether there are any disinfectants known to science which really disinfect. The few opportunities I have had of observing the experiments in disinfectants may perhaps have been no fit test. They may not have been sufficiently thorough in their application, as in a case I recollect which occurred in the city of Perth in Scotland, when some cases of cholera caused considerable alarm among the people. The provosts and magistrates held a meeting the wise men of the city took counsel together, and lo! two alleyways were straightway whitewashed. The cholera gradually vanished, but it was in no hurry about it.

A recent experience in my own house might not be uninteresting to your readers. Last October one of our children was taken with scarlet fever. The doctor advised us to send two of the younger children away, and by confining the sick child to a room in the third story of the house lessen the chances of infection. The instructions were immediately obeyed. The two children were absent from the house nearly three months. The sick child had entirely recovered, and a system of fumigating was ordered. Everything was removed from the room where the sick child had been; in fact, from two rooms, the parlor and bedroom immediately adjoining. Carpets and other material were burned. A quantity of dry sulphur was burned in the rooms, about two pounds, which kept the rooms in a state of suffocation for several hours. Then a complete washing of floors and every article of furniture was carefully performed, the walls and ceilings being thoroughly cleaned, nearly a gallon of carbolic acid being used in the operation. The bedstead and other movables were revarnished, and after a readjustment of material another burning of sulphur, about one pound, was proceeded with. A considerable quantity of sulphur was also used in the kitchen on the ground floor, and every suggestion of our medical adviser was punctually attended to.

The sulphur was burned partly in a coal-shovel set in the stove, the door of the stove being open and the damper in the stovepipe shut, and another quantity in the other room in a smaller shovel set in a

coal-scuttle. No water was used, and there was no water in the rooms at the time; this I am sure of. The burning of the sulphur was exactly as the doctor had instructed us. The area of the floor, $36 \times 18 = 648$, about 11 feet high, $= 7128$ cubic feet, minus the hallway, $6 \times 24 \times 11 = 1584 = 5544$, or about 5000 feet divided into three rooms. I am not quite positive that the quantity burned on the first occasion amounted to two pounds. Possibly one-half pound was used in the kitchen, which would make one and one-half pounds in the two rooms, or probably more. On the second occasion the quantity used was perhaps not more than half as much. We were not particular about the quantity. There was more used than the doctor thought sufficient.

The doctor recommended leaving the windows open during some of the coldest days in December, and two days particularly the temperature in the rooms was at least ten degrees below the freezing-point. After the doctor had assured us that it was perfectly safe to bring the children home, we burned another quantity of sulphur, about one-half pound, dry, and delayed the coming home about a week.

They came home on Christmas Day, and, as you may imagine, it was a kind of merry Christmas with us. Just eight days after, one took the fever, and on the third day succeeding the other followed. One peculiarity was that neither of the latter cases resembled the first; for, while the first case had the fever accompanied with intermittent delirium, the other two were quite rational but had severe affections of the throat. One of the latter cases was particularly serious, the doctor hardly expecting recovery. They all recovered.

I may add that during the period the latter two were afflicted, every one in the house was more or less affected with sore throat, even two or three visitors also becoming similarly affected.

I cannot, therefore, place much faith in dry sulphur or carbolic acid as disinfectants. It would have been a great saving of trouble to us if the children had been permitted to stay at home and had the disease together. We did the best we could. Since their complete recovery we have not bothered about any more sulphur.

J. K.

MISCELLANEOUS.

BROOKLYN VITAL STATISTICS FOR MARCH, 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Population, estimated April 1,
1889.....821,525
In the month of March there were 1686
deaths, the rate of mortality being
24.37 per 1000 of population.

The number of Births reported
was 1110
The number of Marriages reported
was 325
The number of Still-births reported
was 108

The mortality by classes and by certain of the more important diseases was as follows :

Causes :

1. Zymotic.....	346	Malarial Diseases.....	7
2. Constitutional.....	301	Diarrhoeal Diseases (all ages).....	15
3. Local.....	857	“ “ (under 5 years).....	8
4. Developmental.....	140	Phthisis.....	181
5. Violence.....	42	Bronchitis.....	117
Measles.....	51	Pneumonia.....	247
Croup.....	43	All Respiratory.....	402
Diphtheria.....	105	Bright's Diseases.....	40
Scarlet Fever.....	36	Puerperal Diseases.....	17
Typhoid Fever.....	6	Old Age.....	34
Whooping Cough.....	48	Suicide.....	13

Reported Cases :

Diphtheria.....	295	Measles.....	1251
Scarlet Fever.....	405	Typhoid Fever.....	15

Deaths by sex, color, and social condition were as follows :

Male.....	875	Foreign.....	476
Female.....	811	Married.....	425
White.....	1646	Single.....	1018
Colored.....	40	Widows, Widowers, and not stated.....	243
Native.....	1210		

Still-births, excluded from list of deaths, were as follows :

Males.....	58	} Total.....	108
Females.....	50		
Deaths in public institutions.....	117	Homicides.....	1
Deaths in tenement houses.....	828	Suicides.....	13
Inquest cases.....			

Age periods :

Deaths under 1 year.....	360	Total deaths 5 to 20.....	152
Deaths under 5 years.....	362	“ “ 20 to 40.....	286
Total deaths under 5 years.....	722	“ “ 40 to 60.....	260
		“ “ 60 and upwards.....	266

Certain foreign and American cities show the following death-rates for the month of March, 1889 :

Brooklyn.....	24.37	Vienna.....	24.72
New York.....	28.56	Paris.....	24.54
Philadelphia.....	20.21	London.....	18.78
Berlin.....	22.20	Glasgow.....	28.64
Dublin.....			29.18

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 8.

BROOKLYN, N. Y., AUGUST, 1889.

WHOLE No. 20.

ORIGINAL ARTICLES.

THE DISPOSAL OF THE DEAD.

BY JOHN M. PEACOCKE, M.D.

Read before the Medical Society of the County of Kings, April 16th, 1889.

In primitive times, before men began to multiply on the face of the earth, it is probable that the dead were laid in woods or anywhere above ground where they were exposed to the action of the elements and became a prey to the beasts of the field and the fowls of the air.

Since that remote period mankind has adopted four principal methods for the disposal of the dead - interment, embalmment, entombment and incineration.

Strange burial customs are to be found in different countries, and form in many instances distinctive characteristics of the people practising them.

The Ethiopians salted the body to keep it from putrefaction, and then enclosed it in a coffin covered with glass, through which the remains might be seen. The Parthians, Medes, Iberians and Caspians had such a horror of the decomposition of the body that they rejected all interment and cast the dead into the open fields to be devoured by wild animals.

The Kamtchatdales keep special dogs for the purpose of devouring the dead. The ancient Ichthyophagi, who dwelt on the shores of the

Persian Gulf, committed the corpse to the silent depths of the sea. A like form of aquatic burial is still prevalent among some American aborigines, who deposit the dead in a canoe and launch it on a stream or lake remote from human habitations. The Parsees, the modern followers of Zoroaster, erect high towers, called the Towers of Silence, on which are exposed the naked bodies of the dead which become the prey of vultures. The Chaldeans, though worshippers of fire, regarded the burning of the dead as an insult to their deity. The Scythians practised aerial sepulture. The dead body was sewn up in skins of animals and suspended from branches of trees. A similar custom is occasionally observed by some of our Indian tribes, who envelope the corpse in a buffalo hide and place it on an elevated platform. The ancient Mexicans burned the dead, and only consigned to the grave the bodies of those who had been drowned or died of dropsy. The Mussulman regards the grave with feelings of the deepest reverence. He requires it to be of certain size and sufficient depth that he may be able to rise in it to his knees and wrestle with the angel at the last day. The Chinese look upon the funeral as a most important undertaking. There is no object of science or art dearer to the heart of a Chinaman than his coffin. A wealthy man will expend several thousand dollars upon this piece of vanity. A man of limited means will give all he has, and a son is frequently known to sell himself for a slave that the remains of his father may rest in a rich coffin.

The earliest mode of burial was interment. The word *burial* is derived from an old Anglo-Saxon word which means concealment. According to Josephus, the first interment was that of Abel. Cain buried the body to cover his crime. The patriarch Abraham strikes the keynote of the reason for burial, when, on the death of Sarah, he said to the children of Heth: "Give me possession of a burying-place that I may bury my dead out of my sight." "There they buried Abraham and Sarah his wife; there they buried Isaac and Rebecca his wife; and there I buried Leah."

Moses was buried in a vale in the land of Moab. No man dug his grave, for "the angels of God upturned the sod and laid the dead man there." The Hebrews buried in caves or sepulchres, or in graves in the open fields. They were very exact in all the minutæ relative to the final disposition of the dead. After death the body was well washed, generally with a strong solution of native carbonate of soda, anointed with highly aromatic unguents, and swathed in numerous folds of linen. According to Pliny, earth burial was customary in the early days of Rome. The law of the famous Twelve Tables expressly forbade the burying or burning of the dead within the city, or within sixty feet of any house, without the consent of its owner. Large tracts

of land in the suburbs of Rome were donated by the patricians and appropriated to purposes of interment. These were the origin of cemeteries (*places of repose*). The primitive Christians in Rome buried in the catacombs. Many of these subterranean passages are of great antiquity and were connected with quarries hewn long before the Rome of Romulus and Remus was founded. They represent whole cities of the dead and contain in all about 6,000,000 bodies. Burial and not cremation seems to have been the one design and purpose of the catacombs. The early Christians regarded cremation as a pagan rite, entirely antagonistic to their belief in the resurrection of the body. The persecution against the Christian church ceased with the conversion of Constantine in 312.

During his reign Christianity became the imperial faith, and by his memorable edicts of toleration the Christians were allowed to possess land without fear of disturbance, and bury their dead publicly and above ground without danger of molestation. In 509, the Senate gave permission to Pope Marcellus to establish the first Christian cemetery in Rome. The honor of being buried within the precincts of the Christian sanctuary was first assigned to the Emperor Constantine, whose remains were deposited in the vestibule of the Church of the Holy Apostles at Constantinople. With his death originated the custom of burial in churches. The desire to find a resting-place in hallowed ground is not confined to Christianity, even those considered pagan had exalted ideas of the sanctity of the ground surrounding their temples. Pachacamac was the sacred City of the Supreme Divinity of Peru and the Mecca of the land of the Incas centuries before the advent of Pizarro. Here was erected a magnificent temple of the Sun. A distance of two hundred paces from it was considered holy, and no one was allowed to pass within this boundary but with naked feet. Its vicinity seems to have been used as one vast cemetery. Exploration therein has revealed countless number of desiccated bodies, lying tier upon tier, showing how great must have been the concourse of people and how eager the wish to be buried within the shadow of the walls of that once mighty structure dedicated to the Creator of the world.

The almost universal sentiment to bury near the remains of the sainted or illustrious dead is only the expression of an instinctive feeling which awoke very early and acted very powerfully in the Christian church. It is in fact an echo, reverberating through the centuries, of the desire of the old prophet of Bethel that his bones should be laid beside the bones of the man of God from Judah. With the propagation of Christianity, the baneful practice of church burial became more and more popular. Several decrees were issued to stop the evil, but

in vain; the canon bearing on the matter was erased, and the law concerning it became a dead letter. The churches could not accommodate all the dead, consequently the majority of the bodies of the faithful were interred in the surrounding enclosures or churchyards. Medical authorities in the eighteenth century pointed out the danger accruing from intramural interment, and the governing powers of civilized countries were appealed to. In England the whole system of intramural interment was checked by Mr. Chadwick and other sanitary reformers in 1844. Measures were afterwards carried out for closing graveyards in crowded cities and placing interment in cemeteries under sanitary control.

At the present day the custom of burial within cities is on the wane. Cemeteries are to be found in the vicinity of all centres of population both at home and abroad. They are, as a rule, far different from the old churchyards, and are more spacious than formerly. In their location the public health has been considered, and regulations have been adopted as to depth of graves and their distances from dwellings and wells. In thickly settled Europe, where the ground is more or less limited and the population dense, the overcrowded state of churchyards and cemeteries can be readily accounted for; yet in a new country like this, with an almost boundless domain, the incontrovertible fact confronts us that in many burial places, and not very far away either, one grave is not permitted to be set apart for one body.

The late Rev. Dr. Beugless says: "Of the great cemeteries about New York, there is not one, not even Woodlawn or Greenwood, in the public lots of which three or more bodies are not put in one grave, that of John Doe who died from a "bare bodkin" being sandwiched between those of Richard Roe and James Low who were the victims respectively of small-pox and yellow fever."

Few cities are so generously supplied with cemeteries as Brooklyn. They hedge in the city on all sides, occupy nearly two thousand acres of valuable real estate, and include some of the choicest building sites. These burial places are destined to be, in the near future, within the city limits and encompassed by human habitations. Their founders located them far off, as they thought, in the country, remote from chance of municipal encroachment and distant from the hum and the hurry, the haunts and the homes of the living town. The city of New York is extending so rapidly that, as time rolls on and population increases, it would not be improbable for the great metropolis to include within its boundary the whole of Kings County, part of Queens and part of Westchester Counties. Where will the present cemeteries be then? Right in the centre of a teeming population, which in time, from stress of space, will be compelled to build their dwellings upon these beds of pestilence.

In 1794, not one hundred years ago, the population of New York City was 35,000, and then the municipal authorities located the Potter's Field at the corner of Greenwich and Albany roads, or not far from what is now the west end of Chambers Street. There had been pauper burials in the north end of the City Hall Park, and the negro burial ground at that time was on the site of the Stewart Building, at the corner of Broadway and Chambers Street. Nearly all the churches in town were south of this, and each had its own graveyard. In 1801, the city selected, on account of its retired location, the place now known as Washington Square as a Potter's Field. It and other far-off fields were rubbish grounds where the city authorities dumped the poor dead.

When the cemeteries of Père la Chaise and Montmartre in Paris were established, they were on hillsides that were at some distance in the country. Now, though they are not in the heart of the city, they are far within the city limits and have a dense population on all sides of them. Père la Chaise is so overcrowded with decaying bodies that ordinary cadavers are dug up after five years in order to make room for their ghastly successors.

The putrid emanations from these Parisian cemeteries have caused fevers of a typhoid type, diseases of the throat and intestinal canal, to which numbers fall victims every year. The French Academy of Medicine reports that these diseases have been traced to the vitiated air and water in the neighborhood of these burial places. In Naples an unique form of interment prevails. Three hundred and sixty-five pits are dug, one for each day in the year. All who die within twenty-four hours are put into one of these.

Referring to this wholesale burial, Dr. Curtis, of Chicago, has facetiously said: "After enjoying for three hundred and sixty-four and a fraction days 'the sweet rest of the grave' that poets sing of, the trump (and in this case spades are trumps) bids the dead arise."

The "Potter's Field" of New York City is located at present on Hart's Island. Since 1869 more than 60,000 bodies have been buried there. There are no single interments, the bodies are placed in trenches, dug in regular rows, 45 feet long, 14 feet wide, and 10 feet deep. Each of these pits will hold 150 bodies, which are laid three deep, in six rows of twenty-five each. In 1887, 4158 bodies were buried on Hart's Island; the interments average about thirty per day. In the public or poor quarter of Calvary Cemetery a trench is dug, 7 feet wide, 10 to 12 feet deep, and of indefinite length, in which the coffins are stowed tier upon tier, making a flight of steps, five or more deep, and with not enough earth to hide one from the next.

A positive danger lurks in this form of burial, as when numerous

bodies have been interred in a space of limited size and within a comparatively short period of time, the earth becomes so saturated with the foul products of decomposition that it is incapable of further absorption. The modes described of burying the pauper dead in pits of putridity is a disgrace to our vaunted Christianity and a blot on our civilization. If land be too dear to give the dead poor a decent burial, respectful to the departed and innocuous to the living, a thousand times better it would be that their bodies should be burned and their ashes buried.

The proposed incineration of Isaac by Abraham on Mount Moriah appears to have been the first authenticated case of burning the dead. Although not consummated, it undoubtedly had the approval and authorization of Jehovah. In Amos, it is said that Moab burned the bones of the King of Edom into lime; and, in Samuel, that when Saul the King of Israel and his sons fell in honorable warfare with the Philistines, "the valiant men of Israel arose and went by night and took the body of Saul and the bodies of his sons from the wall of Bethshan, and came to Jabesh and burned them there, and they took their bones and buried them under a tree at Jabesh."

The Assyrian tombs discovered on the banks of the Euphrates and Tigris furnish unmistakable evidence of cremation. The Jews practised incineration for sanitary reasons in times of plague and pestilence; the bodies were burned in the vale of Tophet. Cremation was adopted in Asia at a very early period. It was known to the Hindoos from a remote date. From India it extended to the Western world, and was followed there by the Thracians, Celts, Sarmatians, and other nations. Though the last funeral fires expired in the fourth century, yet the Indo-Germanic nations burned their dead until late in the mediæval times. The first mention of incineration in Greek literature occurs in the *Iliad*, and refers to the funeral of Patroclus and Hector. Homer did not regard the process as an innovation, but rather as the common usage. Many of the notable men of Greece were incinerated—Solon, Alcibiades, Pyrrhus, Plutarch, and others. Cremation was not in general favor among the Romans until towards the termination of the Republic. Sylla, in B. C. 78, was the first patrician who desired to have his remains incinerated. Julius Cæsar, Brutus, Octavius, Augustus, Tacitus, and several other celebrities of that age, were cremated. The funeral rites among the Romans varied according to the means of the deceased. In the latter days of the Republic, and under the earlier emperors, the remains of the rich were washed, anointed with oil, and perfumed by the slaves of the undertakers. Balsams were poured over the corpse, it was enveloped in asbestos, placed on the pyre and covered with cypress boughs. The nearest relative unclosed the eyes of

the deceased and, with averted face, applied the torch to the wood. As the flames ascended the favorite animals of the departed were sometimes flung into the fire, as well as costly arms and robes. Various perfumes were added and were rendered necessary by the disgusting odor. The amount of spices, oils, and balsams destroyed at incinerations was enormous. Pliny reports that Nero used up more incense, myrrh, and other aromatics at the cremation of Poppœa than could be produced by the whole of Arabia in one year. When the burning of the body was completed, the embers were soaked with wine. The bones and ashes of the deceased were gathered by the friends, who sprinkled them with perfumes and placed them in an urn. The urns were of rich design and artistically decorated, and were made of marble, alabaster, or baked clay. When sealed they were deposited in niches called *columbaria*, from the resemblance of their arrangement to a dovecot. Nathaniel Hawthorne was so charmed by the exquisite beauty of some of the urns and columbaria as to lead him to remark that he would not object to be decently pigeonholed in a Roman tomb. During the Trojan war incineration appears to have been adopted that the remains of the dead heroes might be restored to their native land. A very good account of burning the dead as customary among the ancient Romans may be found in Bulwer Lytton's novel, "The Last Days of Pompeii." The cremation of the rich was attended with such pomp, ceremony, and expenditure of money, that the poorer classes were compelled to resort to interment as being the much cheaper way for the disposal of the dead. This finally led to the re-introduction of earth burial, which strangely enough was coincident with the decline and fall of the Roman Empire. During the time that cremation was customary in Rome the color of the habiliments of mourning was white; when interment was the practice the hue changed to the sombre black.

As Christianity spread, incineration became gradually obsolete, and the dead were consigned to the slow and loathsome process of putrefaction in the grave or tomb. For centuries cremation lay buried in oblivion; it was not entirely forgotten, as efforts at its revival were made at long intervals. These endeavors were brought to a climax in 1868, when cremation was introduced at the Medical International Congress at Florence as a sanitary measure of great importance. A lively enthusiasm was then kindled and an impetus given, resulting in the growth of the movement, despite the determined opposition shown toward it.

The process of cremation, as conducted at Gotha by means of the Siemen's apparatus, is thus described:

"The body is borne into the chapel and placed in a catafalque which

stands in front of the altar. The section of the chapel-floor upon which the body rests constitutes the floor of a lift, or elevator. As the funeral service proceeds the elevator invisibly and noiselessly descends, bearing the body to the basement directly in front of the incinerator, which by means of superheated air, has been raised to a white heat within, at a temperature of about 1500° Fahrenheit. As the door of the incinerator is opened to receive the body, the inrushing cold air cools it to a delicate rose tint; and the body, resting on a metallic bed, covered with a cloth of asbestos, or of linen soaked in alum, passes over rollers into this bath of rosy light. Immediately it becomes incandescent, in which condition it remains until incineration is complete. This requires about an hour per hundred pounds of the original weight. There remain only a few handfuls of pure pearly ashes, equivalent to about four per cent. of the original. These are dropped by means of a lever into the ash-chamber below, and are drawn thence into an urn of terra cotta, marble, alabaster, or other suitable material, and returned by means of the elevator to the catafalque. The service or ceremony being now over, the friends of the deceased find the ashes just where they had last seen the body of the departed, and may bear them thence to the columbarium or mortuary chapel, or set them in the border and plant violets, heartsease, and forget-me-nots in them from year to year.

‘And from his ashes may be made the violet of his native land.’

“No fuel or flame of foreign substance comes in contact with the body. The process is accompanied with no perceptible sound or smell or smoke—absolutely nothing that can offend the sensibilities of the most fastidious. All the smoke and volatile products of combustion are passed through a regenerating furnace before being turned loose into the air, and are absolutely purified. The process is indeed in every way so decorous and so beautiful, as compared with other methods of disposing of the dead, that it is described by those who have witnessed it as ‘fascinating,’ and scarcely an instance is known of any one having witnessed the process, as thus conducted, who has not at once become a pronounced convert to cremation, whatever may have been his pre-existing prejudice.”

As a hygienic and economic measure, cremation is recognized as a proper sanitary process. It has been indorsed as a sanitary necessity by the Society of Medical Jurisprudence and State Medicine of New York, the American Public Health Association, and the American Medical Association. In England it is now regarded in quite a favorable light, and the *London Times*, which was once so hostile to the movement, has come around and now upholds what some years ago it so vehemently opposed.

Europe has twenty-four crematories, situated at London, Paris, Rome, Brussels, Gotha, Dresden, Florence, Copenhagen, Milan, and other places. About 800 bodies have been incinerated in Germany and about 1200 in Italy.

In the United States there are twenty-two cremation societies and ten crematories; the latter are located at Fresh Pond, L. I., Washington, Pa., Lancaster, Buffalo, Pittsburgh, Cincinnati, Los Angeles, Detroit, St. Louis, and Philadelphia. Crematories are in course of construction in Baltimore, San Francisco, Davenport, San Antonio, and Louisville.

At Fresh Pond, L. I., the first body was incinerated on December 4, 1885. Up to November 25, 1888, 229 cremations have taken place there. The charge for each incineration is \$35. The actual cost to the company for same is \$15.

The three chief impediments that obstruct the advance of cremation are the sentimental, the religious, and the medico-legal.

The late Professor Gross alluded to the sentimental objection in the following words: "If people could see the human body after the process of decomposition sets in, they would not want to be buried, they would be in favor of cremation, and would look upon burning the human body as a beautiful act in comparison with burying it. There is something eminently repulsive to me about the idea of lying a few feet under the ground for a century, or perhaps two centuries, going through the process of decomposition. When I die I want my body to be burned."

This burning and shining light of the profession further said: "People's prejudice is the only opponent that cremation has." Dr. Buck remarks: "The real objection of most people to the practice of cremation is an emotional phenomenon, and therefore the harder to reach by argument. It is altogether probable that if bodies were usually burned and burial were proposed as a substitute, there would be an outcry of horror at the barbarous suggestion." Only because the putrefactive process is hidden that it is tolerated; should it take place openly and within sight, the whole civilized world would rise indignantly and sweep such a vile custom from the face of the earth.

Many distinguished men among the clergy are opposed to cremation on religious grounds. The Bishop of Lincoln, in Westminster Abbey, July 5, 1874, denounced incineration as barbarous and unnatural, and said, "One of its first fruits would be to undermine the faith of mankind in the doctrine of the resurrection of the body." His Lordship has been pertinently asked, "Can it be supposed to be less possible or less easy for the all-knowing and almighty God to gather and revivify the material atoms after they have been oxidized

and scattered by the agency of the incinerator than after precisely the same result has been accomplished by combustion in the earth." And if, as the Bishop of Lincoln seems to assume, it is impossible for God to raise up the bodies of those who have been burned, what, it is asked, is to become of the many of the noble army of martyrs who were burned at the stake, or devoured by lions and tigers in the arena, or broiled on beds of iron, rather than renounce their holy faith. Does the Bishop really mean to say that there is to be no resurrection of the bodies of Archbishop Cranmer and Bishops Latimer and Ridley who went to heaven in chariots of fire. The Bishop of Manchester, referring to the consecration of a cemetery, said in 1880: "I feel convinced that very soon we shall have to face the problem how to bury the dead out of sight with safety to the living. I hold that the earth was made for the living and not for the dead. No intelligent faith can suppose that any Christian doctrine can be affected by the manner in which, or the time in which, this mortal body crumbles into dust and sees corruption. The question must be met, for cemeteries are becoming not only a difficulty and a great expense, but an actual danger." A Roman Catholic clergyman remarks: "As to the religious aspect of the question, nothing can be more reverent than this mode of disposing of the dead, and the words of the funeral service, 'ashes to ashes,' will possess a reality they never did before; also the beautiful anthem, 'When thou passest through the fire I will be with thee, would find a most touching response."

Canon Liddon said, in a sermon at St. Paul's Cathedral, "The resurrection of a body from its ashes is not a greater miracle than the resurrection of an unburnt body. Each must be purely miraculous."

The medico-legal objection that is strongly urged against cremation is that by the process of incineration all evidences of crime in case of poisoning would be lost. This is certainly a forcible argument against cremation. But, even when the body is not destroyed by fire, vegetable poisons, if administered, are not always discovered by analysis, and are with difficulty detected after death, especially if the body has lain in the grave for any length of time.

Speaking of the mineral poisons, Dr. W. H. Curtis remarks: "Of this class, very rarely are more than two or three used with criminal intent, and these, particularly arsenic, present such plain and unmistakable ante-mortem phenomena as to render the necessity for the disinterment of the body an act of gross carelessness."

Dr. Selmi, the renowned Italian chemist, has shown by protracted experiment, and his results have been confirmed by other investigators, that the common constituents of the body, as the brain, blood, fibrin, etc., perfectly innocuous in health, are rapidly converted by decompo-

sition, under certain conditions of heat and moisture, into deadly poisons similar to the vegetable alkaloids and just as virulent.

Professor Selmi first suggested, in 1875, the name *ptomaines* to designate these cadaveric alkaloids obtained from putrefying organic material. As the *ptomaines* are true alkaloids, and as such are members of the same chemical group as the vegetable alkaloids, the possibility that one of the former may be mistaken for one of the latter in a chemico-legal examination is obvious. Such errors have actually occurred beyond the shadow of a doubt. Three such cases are well known. Time will only allow allusion to one. General Gibbone died in Rome under circumstances which awakened a suspicion of poisoning. The chemists who analyzed portions of the body after death were of the opinion that death was caused by *delphinine*, an alkaloid of stavesacre. Selmi saved the prisoner from the sentence of death by proving to the satisfaction of the tribunal that the alkaloid obtained from the body of the deceased did not respond to several of the reactions of *delphinine*, that it was not that alkaloid, but a *ptomaine*. Professor Thompson, an expert in chemistry, says: "As to the difficulty about post-mortem evidences of criminal poisoning, it has been evident in recent times that such evidence, however obtained, has not had much weight with juries since they are aware of the liabilities to inaccuracies and uncertainties."

The medico-legal objection to cremation might be further met by a revision of the laws governing the appointment of coroner. At present the investigation of cases where sudden or suspicious death has occurred is sometimes seriously handicapped by the fact that the important office of coroner is often vested in the hands of men, frequently laymen, who are not qualified for such duty.

Undertakers now generally use an embalming solution for the temporary preservation of the body. Arsenic, corrosive sublimate, and other deadly poisons enter into the composition of the solution. In case of suspected poisoning, say by arsenic, if the body had previously been injected by the so-called embalming fluid, the subsequent analysis would be attended with well-nigh insurmountable difficulties. An earlier poisoning could not be distinguished with certainty from that effected by the injection used by the undertaker.

We are now living in a practical age, when the question of economy is an important one, and in times when by touching a man's pocket we come in contact with a very sensitive portion of his organization. It is universally conceded that there is useless and extravagant display on funeral occasions. Every year sees families in New York, Brooklyn, and elsewhere, homeless and breadless because of the enormous and unnecessary expense incurred in burying the dead. An

evening paper not long since informed its readers that "A millionaire pill doctor named Henry Hillen was buried at Wilmington, Mass., in a \$10,000 coffin which it took two years to make. There was a \$10,000 box to enclose the coffin, the total expenses of the funeral reaching nearly \$25,000." And further that "Mrs. Hillen, widow of the Wilmington, Mass., pill maker, goes to her husband's tomb every day, leaves a bunch of flowers, asks the corpse how he passed the night, and pays a man \$5 a day for visiting the tomb at evening and crying, 'Good night, Dr. Hillen; we hope you will rest well.' She frequently 'tries on' her own coffin, which, like her husband's, cost \$10,000; but when at the pill works she is said to be 'all business' "

Careful statistics show that the sums expended for funerals in this country exceed all the product of our gold and silver mines, and by actual computation they exceed the amount of all the failures of the business houses of the country. The waste of land is well worthy of consideration. The cemeteries surrounding cities embrace many acres of valuable land. They are all, by law, exempt from taxation. Property in the vicinity of these cemeteries is depreciating and taxes are increasing. Gravediggers, tombstone-cutters, florists, and saloon-keepers are the principal parties attracted to such localities. The cemeteries at Newtown, L. I., cover a very large territory. They contain more than 3,500,000 human remains, and receive annually 30,000 bodies of people dying in New York and Brooklyn.

One principal feature in cremation, looking at it from an economical standpoint, is its cheapness as compared with interment in cemeteries. The average cost of burial lots in Woodlawn and Greenwood, each containing space for six graves, is about \$450, or \$75 per grave. The cost of single graves in the public lots is about \$25 each. The cost of a modest head and foot stone and their erection will add \$75 more, making a total of \$250 or \$300. Assuming the carriage hire to be the same in either case, the cost of cremation decorously performed, including the case in which the body is carried to the crematorium, should not exceed \$40; add \$5 for a terra-cotta urn and \$10 for a niche in the columbarium, and \$5 for an inscribed tablet under the niche, and we have \$60 as against \$250 or \$300 for earth burial.

Embalming is the process of preserving animal bodies from decomposition by introducing antiseptic substances into the spaces left vacant by the removal of the internal parts. This art was extensively practiced by the ancient Egyptians, Assyrians, and Persians. It was carried to the highest point of perfection by the Egyptians. The mummies found at this day in sepulchres where they had lain for over three thousand years, testify to the completeness of the method reached in those early days. It has been estimated that more than 400,000,000

human mummies were made in Egypt from the beginning of the art of embalming until its discontinuance in the seventh century. Herodotus and Diodorus agree in the statement that there were three grades of embalming. The first cost, in our money, was about \$1,225, the second about \$375, and the third was very cheap.

The process of embalming a mummy of the first class is thus described: The brain was first removed, partly by a hook inserted through the nose causing destruction of the ethmoid bone, and partly by subsequent injection of water. The organs of the abdomen and breast were removed through an opening, about three inches long, in the left hypogastrium. The thoracic and abdominal cavities were filled with the purest bruised myrrh, cassia, and other aromatics except frankincense. ("The spicery and balm and myrrh," mentioned in Genesis, as carried by the Ishmaelites to Egypt, were principally for the use of the embalmers.) The body was afterwards put in natrum, which is not our nitre, but subcarbonate of soda. This salt was found in abundance at the natron lakes in the Lybian desert. The body was left in the natrum from thirty to seventy days, after which it was removed, carefully washed, and enveloped in bandages of fine linen cloth held together by gum. When thus prepared it was returned to the family. The embalming of a mummy of the second class was simpler. A substance obtained by distilling cedar wood, containing among other things carbolic acid (perhaps the first time it was used as an antiseptic), was injected through the rectum into the body and allowed to remain there while the body lay the usual time in the soda salt (*Mead*). The third mode was customary among the poor. The bodies were pickled for a number of days and then boiled in bitumen. These mummies are devoid of hair and eyebrows, are black, dry, heavy, and very hard to break.

Combustion is the means that Nature employs for the destruction of the dead body. It may be prolonged for an indefinite period in the grave. In the retort of the crematorium or the funeral pyre the body is reduced to its constituent elements in a few hours. The final result is the same in each case. The difference lies in the time in which the result takes place. In cremation the end is attained in an hour without any injurious consequences to the living; in earth burial, in an eighth, quarter, or half a century, with more or less menace to health.

"In earth burial the length of time necessary to effect complete decomposition varies according to the character of the ground. It may be accepted as a rule that in favorable soils, porous and well aerated, decomposition will be fully accomplished in from three to four years; and in soils, dense, clayey, or wet, the putrefactive process

may be delayed from ten to fifteen years or longer. The remains of the young decompose with greater rapidity than those more advanced in life, those of females more rapidly than of males, and those dying in full health than those whose tissues are wasted by disease. Persons dying from diseases of a malignant nature, or where the fluids were in a depraved condition, decompose with still greater rapidity. When decomposition takes place the parts become soft, change in color, exhale a disgusting odor, diminish in weight, and afford several products, some of which escape in gaseous form, others pass off in a liquid state, and others again are contained in a fatty or earthy residuum."

Sir Henry Thompson said in 1874: "No dead body is ever placed in the soil without polluting the earth, the air, and the water above and around it." The late Disraeli said, in the House of Lords in 1880: "What is called 'God's acre' is not adapted to the time in which we live, nor to the spirit of the age. The graveyard is an institution very prejudicial to the public health, and the health of the people ought to be one of the first considerations of a statesman. The time has arrived when a safer method for the disposal of the dead should be instituted."

Dr. Buck, in his work on Hygiene, remarks: "It is impossible for any one to say how long the *materiæ morbi* may continue to live underground. If organic matter can be boiled or frozen without losing its vitality, and seeds three thousand years old will sprout when planted, it would be hardihood to assert that the poison of cholera, or small-pox, or typhus may not for years lie dormant, but not dead, in the moist temperature of the grave." Dr. Parkes said: "If the dead are buried, so great at last is the accumulation of bodies that the whole country round a great city becomes gradually a vast cemetery. After death the buried body returns to its elements; if, instead of being buried, the body is burned, the same process occurs more rapidly. Neither affection nor religion can be outraged by any manner of disposal of the dead which is done with proper solemnity and respect to the earthly dwelling places of our friends. Burying in the ground appears certainly to be the most insanitary plan." Dr. Spencer Wells writes: "When the people know how great are the evils dependent on burial in the earth, even when this is done under the most favorable conditions, public sentiment must favor cremation in place of corruption, and for putrefaction substitute purification." Dr. A. N. Bell says: "Cremation commends itself to many of the foremost sanitarians, church dignitaries, and others distinguished for their intelligence in the most enlightened communities of the present day everywhere."

The Report of a Committee of the American Public Health Associ-

ation, read at St. Louis, May, 1886, Dr. James M. Kellar of Arkansas, chairman, states: "We believe that the horrid practice of earth burial does more to propagate the germs of disease and death and to spread desolation and pestilence over the human race than does all man's ingenuity and ignorance in every custom or habit. The graveyard must be abandoned. The time has come for us to face squarely the problem how to dispose of the dead with safety to the living. And your committee has an abiding faith that you will earnestly and at once say that the earth was made for the living and not for the dead, and that pure air, pure water, and pure soil are absolutely necessary for perfect health. Only skeptics deny that the dead do poison these three essentials of human life."

It has been ascertained that the plague which broke out in Modena in 1828 was caused by excavations made in the ground where three hundred years before victims of the plague had been buried. A similar occurrence took place a few years ago in Derbyshire, England, and the terrible violence of the cholera in London in 1854 was charged to the upturning of the soil wherein the plague-stricken of 1665 were buried. In 1806 the New York Board of Health advised the removal of all graveyards within the city limits, and recommended that the then existing burial places be converted into public parks. This was done to some extent, and Washington Square, which was then the "Potter's Field" of New York, is one of the fruits of this recommendation. A physician who lived several years on its western border declares it impossible to raise children on the ground floor of houses in that vicinity.

In the Report of the Committee on Hygiene, read before the Medical Society of the County of New York, June 25, 1886, are enumerated the many sources of pollution of the water supply of New York City found to exist in the Croton Valley watershed. Among them are five cemeteries.

Dr. A. N. Bell, speaking of these last-named burial places, remarks: "An enormous mass of putrefying human remains has evidently accumulated in the five cemeteries referred to, and this is constantly being replenished by not less than four hundred dead bodies annually—and all the excretions and soakage of this loathsome mass of putrefactive material is drained into the Croton! And this, let it be borne in mind, is not surface pollution, or that which is or which can easily be, by common consent, collected and cremated, or purified by combined irrigation and filtration. It is carefully placed beyond these resources, as it is also beyond the most effectual resources of Dame Nature. Deep enough in the earth to be out of the effectual influence of the sun's rays, and, as if

by intent, within the most facile scope of the subsoil currents to take up all that is, and as rapidly as it may be soluble, and convey it to the potable supply."

Dr. Bell, having heard that a "hearing" was in progress before the Aqueduct Commissioners of those opposed to the construction of the Quaker Bridge Dam on economic and sanitary principles, says: "We attended the hearing, and imagine our astonishment when, among others, the chief means urged for obtaining an abundant water-supply was to dam the Bronx below Woodlawn Cemetery! This project would conserve the seepage of many thousand human remains daily accumulating, the waste and excreta of about 50,000 people, the drainage of numerous factories,—but why enumerate? The first condition named will surely suffice. No amount of dilution of such graveyard pollution—to say nothing of the rest, as that which even now the Croton water contains—can satisfy the public demand in the face of patent knowledge such as this. There may be chemists who, because they cannot find traces of such impurities as those referred to, deny their existence and claim that the purifying effect of a mass of water thus polluted restores all such matter to its original elements. But the everywhere asserted evidence of prevailing diseases in all communities which use such water is abundantly sufficient to rebut all such mere laboratory researches."

A late report of the New York State Board of Health says: "The fact is abundantly proved that the noxious qualities of polluted water are not removed by a flow of many miles in an open channel. Even though the water may have become thoroughly clarified by the complete sedimentation of the solids originally held in suspension; and hence, also, that any stream which is defiled with putrescent animal matter, especially such as is derived from human beings, cannot safely be employed as a source of potable water-supply. Both chemical and biological analysis may utterly fail to discover in the water the matter which carries the deadly seeds of epidemic."

On investigating the cause of the outbreak of typhoid fever at Plymouth, Pa., some years ago, it was found that "one of the public water-supplies contained a much greater amount of organic matter than the other, but it was the water chemically purest which carried disease and death" "Modern science has shown that the *quantity* of putrescible nitrogenous matter in water is not the most important thing, but that the *CHARACTER* of the matter is the vital point; and since no practicable method has yet been developed of determining, either by chemistry or the microscope, the pathogenic character of the matter contained in large bodies of water, owing to the minuteness of the quantity which may be harmful and its extreme diffusion, we are as

yet generally left to deal with indications and probabilities in forming conclusions as to large bodies of water like lakes and important streams."

In the strata of air lying in a prolonged calm above a cemetery, Professor Selmi, of Bologna, discovered an organic corpuscle which poisons the atmosphere to the detriment of the living economy, and which, when injected under the skin of a pigeon, caused a typhus-like disease that ended in death in three days. Dr. Domingo Freire, of Rio Janeiro, asserts that, while investigating the causes of a recent epidemic of yellow fever, he discovered the significant fact that the soil of the cemeteries in which the victims of the outbreak were buried was positively alive with microbial organisms exactly identical with those found in the vomit and blood of those who had died of the disease. Some of this soil was dried, and then placed in a cage with a guinea-pig. Previous to the introduction of the earth, the blood of the animal was examined microscopically and found to contain no bacteria of any kind. The animal became ill and died within a few days. When its tissues were examined after death, they were found to present all the characteristic changes which yellow fever brings about. It is now known that earth-worms are capable of bringing to the surface from the grave myriads of bacilli and bacteria which modern science has shown to be the vital principle (or rather the deadly principle) of all forms of zymotic disease.

The recent researches of Pasteur into the cause of an outbreak of charbon have thrown much light on the etiology of that disease. "A sheep which had died of charbon (or anthrax) was buried at the depth of twenty feet in the ground, in a field which, for ten or twelve years after, ceased to be used as a pasture-ground. After that length of time some healthy sheep were pastured in that field; soon after, three sheep were taken ill and died of charbon, at a time when the disease did not exist in that locality or environs. Upon diligent investigation it was found that the animal affected with charbon, and which had been buried twenty feet deep ten years before, was the cause of this new breaking out of the disease. Pasteur demonstrated that the germs of the disease were brought to the surface by earth-worms."

These specific germs lying latent for ten years were not destroyed by that length of time, but still retained all their vitality and were ready to germinate and propagate disease on the first favorable opportunity.

In the *Chicago Medical Examiner* of August, 1874, appeared the following extract from the *Medical Gazette* of Paris: "In the last remarkable report of the Faculty of Medicine of Saxé, Reinhard relates that nine large and several smaller victims of the cattle plague were

interred at Dresden at a depth of ten or twelve feet. It was found the next year that the water from a well situated one hundred feet from the pit in which the cattle were buried had a fœtid odor and contained butyrate of lime. At a distance of twenty feet it had the disgusting taste of butyric acid, and each quart contained about thirty grains of this substance. The bodies were subsequently disinterred and burned."

If earth burial be so innocuous and the products of the grave so harmless as many assert, it is strange that in all well-organized communities strict sanitary ordinances are found essential for the management of cemeteries.

The possibility of the pollution of potable water is shown by the enactment of stringent laws regulating the opening of wells in the vicinity of burial places. The planting of trees in cemeteries to absorb the gases evolved, and the construction of belts of woodland to act as barriers to the escape of noxious vapors, are strongly advocated by many sanitarians. These and other hygienic requirements would hardly be rendered necessary if cemeteries were not considered to be centres of contamination and foci of infection.

Time will not permit extended reference to entombment. The monument erected by Artemisia to the memory of Mausolus, the mausoleum of Hadrian, now the castle of St. Angelo, and the pyramids, have been tombs and the wonder of ages.

Viewing the practice of tomb burial in a sanitary light, an authority says the danger of "the placing of dead bodies in tombs and vaults is far greater than burial in the ground. The earth, doubtless, does absorb and decompose into harmless products a portion of the deleterious products of decomposition; in tomb and vault burial these products are confined and allowed to escape *en masse* on every opening of the vault, or, in the more improved (?) vaults, are allowed constant egress through so-called ventilators." This statement, though plausible, is not entirely correct, as Dr. A. N. Bell clearly shows in an editorial in the *Sanitarian* for January, 1889, with special reference to the Brooklyn water-supply, that the dead bodies are *not* exposed to the action of the earth until long subsequent to the access of the subsoil water, the practice of interment everywhere being to so encase the bodies as to protect them from contact with the earth. The coffins and caskets in general use retard instead of hastening the decomposition of the body. In England, burial in the solid coffin is regarded by many as a source of danger, and, as a result, the use of the "earth to earth" casket is vigorously advocated. This coffin is constructed of perishable material, such as papier-mache or wickerwork.

There remains one other method of preserving the body that is well worthy of notice, and that has not received the attention that its

importance demands. It is the desiccation of the remains. Long before the Spanish conquest the Peruvians were adepts in this mode of preserving the dead. The bodies of the Incas, and their queens and countless numbers of their subjects, testify to this. The interesting question is often asked whether the ancient Peruvians embalmed their corpses or whether the bodies owe their good preservation to the influence of the climate which is so conducive to mummification. Señor Rivero, the director of the National Museum at Lima, having examined hundreds of mummies, was unable to find any preservative substance in them. It is true that in the skulls a brown or blackish mass, in dust or small pieces, has been found, but a chemical and microscopical analysis has proved that the dust and the pieces were composed of cerebral fat and globules of dried blood. All the mummies contain the brain and intestines, and in none of them could Rivero discover any incision which would have been necessary for evisceration had the bodies been subject to embalment. In the mummy of a child found by Dr. Von Schudi, and which is now in the Imperial Academy of St. Petersburg, the ribs of the left side were detached from the sternum, exposing the thoracic and part of the abdominal cavities, plainly showing the heart, with the pericardium, the shrivelled lungs, the diaphragm, the transverse colon, and portion of the small intestines. These facts prove that the Peruvians did not have recourse in the preservation of the dead to any elaborate process of embalming as customary among the Egyptians. The bodies were simply desiccated by exposure to the air. The heated soil and calcined sand on the coast dried the corpse, and the pure cold air and dry winds of the interior did the same thing.

In Peru the animals that drop by the wayside will be found at the end of months entire, not corrupted, but dried. On the highway from Arequipa to Lima a number of the mummified animals are to be seen, and which serve as landmarks to indicate the road when the wind covers it with sand. The climatic conditions of the imperial city of Cuzco are very favorable to the desiccating process. Here, in the great temple of the Sun, the remains of the Incas have been discovered in a marvellous and life-like condition. Cuzco, the most ancient city of Peru, has an elevation of 11,380 feet above the sea. Surrounded by lofty and snowclad mountains, it might be supposed to possess a cold, not to say frigid, climate; but its temperature, though cool, is seldom freezing. In what is called the winter season, from May to November, the pastures and fields are dry and withered, more from drought than from frost.

La Casas describes the Peruvian burial rites, as follows: "The dead are wrapped in the skin of the llama, then clothed and deposited

in a sitting posture. The doors of the tombs, which are all toward the east, are then closed with stone or clay. At the end of a year, when the body becomes dry, the doors are again opened. There is no bad odor, because the skins in which the bodies are placed are sewn up very closely, and from the cold they soon become mummies."

Travelers in Africa have found bodies of camels, which had evidently died of fatigue in the desert, to be so dried and preserved by the heat of the sun that no evidences of post-mortem decay were discovered. The atmosphere of our Northwest Territories is, in some places, so dry that the snows of winter pass off from the ground without leaving it wet, and mummified buffalo have been found on the plains of Colorado. When freshly killed meat is subjected to a dry summer heat, it is rapidly converted into the well-known *jerked beef* of the plains. Dried apples, peaches, and other fruits are familiar examples to every housekeeper of desiccated vegetable matter. This method of preservation is as widely known as it is primitive, and clearly indicates that absence of moisture prevents decomposition of organic material, or, in other words, desiccation takes the place of putrefaction.

Dr. G. Bayles, of Orange, N. J., in 1874, brought before the Public Health Association the method of disposal of the dead by desiccation. He tersely remarks: "I can hardly conceive it necessary, therefore, in presenting the subject, to centre all our thoughts and experimental operations upon one method, and that a reduction solely by means of fire. Has modern chemistry no other resources? Have our electrol-ogists no practical ideas to present, drawn from their magazine of power? Why may there not be a system of thorough desiccation? The desert sands have buried and desiccated many thousands of unfortunate travelers, as well as their camels. We have an unbroken and reliable chain of evidence, sufficient in itself to establish the fact that by excluding moisture and guarding against excessive changes of temperature we can effect desiccation upon *whole* bodies, and that they would continue entire and inoffensive for a length of time which we cannot measure."

The seed sown by Dr. Bayles fifteen years ago did not fall upon stony ground, as to-day it is bringing forth fruit. The desiccating method, as a proper means for the disposal of the dead, is now engaging the attention of many sanitarians and scientists, and in due time will be presented for public attention and investigation. In this process, as now conducted, the corpse is placed in a chamber constructed with pipes so arranged as to bring fresh dry air into them and conduct it through the casket, and by forced draughts through a central furnace, where all the gases and fluids taken from the body are consumed. The air-current is sufficiently rapid to make an entire

change in the space every two seconds. When desiccation begins, the chamber containing the body is hermetically sealed, except as respects the inlet and outlet passages for air, which are closed when the process is completed. It is intended to deposit the desiccated remains in mausoleums which are to be constructed with a view to durability of material, beauty of design, and protection from ghouls. The desiccating method has for its basis the fact that in all animal tissue water is present in greater or less proportion, forming about two-thirds of the weight of the whole body. A man weighing 165 lbs., if completely dried, would therefore lose about 110 lbs. from the evaporation of water. An opportunity was lately afforded me of inspecting and examining the body of a man undergoing the process of desiccation. The remains lay in a glass-covered metallic case, having been placed therein about nine months ago, and at that time weighed 160 or 170 lbs. Judging by the dried-up appearance of the body, I presume that to-day it does not weigh over 60 lbs. The muscles of the trunk, and especially of the extremities, are shrunken and hard. The integument is dry and feels leathery to the touch. The countenance looks natural. There is no discoloration of the cuticle and no evidence of any decomposition. A current of ordinary air is admitted to the casket at one end, it freely circulates around the body, and escapes through a tube, placed at the other end, into a chimney or furnace through which all the volatile products pass before mingling with the atmosphere.

The desiccating process has many commendable features. It complies with all the sanitary requirements, and meets the medico-legal demand that the evidence of crime shall not be destroyed. The rapid abstraction of moisture by this method will do away with the factors in the production of ptomaines which might vitiate the result of a chemico-legal examination. This system is devoid of everything that can shock sensitive minds or offend refined tastes. It does not conflict with the widespread and deep-seated reverence felt for the remains of the dead. The mass of mankind looks not only with aversion but with feelings akin to horror on any process that aims at the immediate destruction of the body. This may be all sentiment; nevertheless no amount of specious reasoning can readily or easily overcome the tender and universal deference for the beloved departed, for it is woven into the very warp and woof of the human heart, and has the religion, the tradition, and the custom of centuries associated with it.

In conclusion, it is well to remember that various important discoveries and many new ideas of science have been ridiculed, declared preposterous, and bitterly opposed. When Benjamin Franklin made the discovery of the identity of lightning and electricity, it was sneered at, and people asked, "Of what use is it?" Dr. Peter Barlow, a dis-

tinguished scientist, declared the impracticability of the electric telegraph. Sir Humphrey Davy argued against the use of illuminating gas as a project without scientific value or even possibility. The discovery of the circulation of the blood by Harvey was received with derision as the utterance of a cracked-brain impostor. When Jenner introduced and established the practice of vaccination as a protection against small pox, the medical profession, at first, refused to make trial of his process. He was accused of attempting to bestialize his species by inoculating the human system with diseased matter from a cow's udder. Vaccination was denounced from the pulpit as being diabolical, and the most monstrous statements regarding its effects were disseminated and believed.

With these examples in view, it is evident that the introduction of any change in the present method of the disposal of the dead will naturally encounter suspicion, criticism, and opposition, except in the case of the method of desiccation, which seems to have been received, so far as presented, with marked favor.

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DISCUSSION.

DR. A. N. BELL.—Mr. Chairman and members of the Kings County Medical Society: I cannot very well decline your invitation to say a few words on this subject, after hearing a paper remarkable for its comprehension and excellence, and the kindly allusions which the author has been pleased to make to some of my writings on the subject. I have heard a good many papers read on the disposal of the dead within the last fifteen or twenty years, and I am quite sure that the one which has just been read is the most complete of them all, possibly because the writer has had before him the greatest amount of modern literature upon the subject.

Permit me to say, however, that I never hear a paper read on the disposal of the dead, but what there is excited in me some of the same sentimental emotions of honoring the dead that seem to have maintained a practice which is chiefly remarkable from the fact that it has only in recent years taken into consideration the protection of the living.

Honoring the dead without regard to the living appears to have been the prevailing sentiment in all time. To honoring the dead we owe the greatest monuments of architecture that exist to-day. To honoring the dead we have some of the finest landscapes and beautifully selected green spots and green trees in the world. Right here in our midst are growing up beautiful cemeteries in honor of the dead; and great shafts and monuments are erected in honor of the dead comparable with the monuments of Egypt erected thousands of years ago.

But the honoring of the dead to the sacrifice of the living, as there is too much reason to believe is practiced in our day, is an appalling question. In the course of my life I have seen the honoring of the dead (in Africa) by placing the dead body upon a scaffold for the birds to eat, while the relatives have gathered food around that the spirit may have something to live upon when it takes its flight, and the bleached bones, which for a time remain on the scaffold, are returned to their original elements without danger to the living. And this means, surely, is no less in honor of the dead than those which are commonly practiced by civilized peoples and Christians everywhere.

The grave which is excavated is but another means of honoring the dead; and so, too, is the vault that is built in the cemetery or cut out of the side of the mountain,—all are of the same purport. But can we say it is honoring the dead if we put it where it is poisoning the living? Never.

I am not here to speak particularly in favor of cremation or any other means for the disposal of the dead, but to give utterance to one single sentiment, to *so dispose of the dead that it shall not endanger the life of the living*. Are our skirts all clear in this particular? Have we carefully considered the subject in all of its bearings? It has given me serious thought; and when I consider cases like one that has been recently reported, I am filled with horror at the suggestions which it awakens.

At a meeting of a cremation society in Glasgow, a few months ago, Sir Spencer Wells cited the case of a churchyard, near Yorkshire, where the bodies of people who died of scarlet fever had been buried thirty years before. A part of the churchyard was closed, but it was afterwards included in the garden of the rector, who had it dug up, and in consequence of this the scarlet fever from which those people

had died thirty years before broke out in the family of that clergyman and spread to the surrounding houses.

We all know or have read of instances of sudden death from the poisonous gases that emanate from the soil where human dead bodies have been buried, and all such gases are well known to be absorbable by water, to say nothing of the disease germs which they float.

But if these gases and germs are pent up in air-tight caskets under ground, how long they will remain dangerous, and yet at all times subject to the loosening of their confines and gaining access to the watercourses, none of us know

The author of the paper has alluded to the grains of wheat found in the wrappings of mummies. It is well known that some of these have been planted and grown, and given name to a species of wheat that is cultivated now in all wheat-growing countries, called "mummy wheat." This germ or seedling wheat was not less than three thousand years old. How much longer than three thousand years it might have remained in the mummy cloth and still have lived and bloomed under congenial conditions, may well be asked of those, in answer to the question, "How long do you suppose a disease germ would live?" I know of no reason why it would not live just as long as a grain of wheat would live, if placed under like favorable conditions.

Some time ago I read—I cannot now recall just where—that among the Mohammedans, in their way of honoring the most distinguished of their dead, they have mausoleums under or in connection with their mosques, where they stow away the bodies in state, as it were, something after the manner suggested in the concluding portion of the paper to which we have listened. And we understand there is a proposition now on foot, a company formed in New York, which proposes to build grand mausoleums in connection with or independent of the cemeteries, as the case may be, where the sentiments of certain people can be gratified, if they do not wish to bury their dead, or are prohibited, as they certainly should be in many cases from burying them so as to endanger the living, and are unwilling to have them cremated. I mention this only as one of the means of disposing of the dead without danger to the living, because it overcomes the objection which touches the sentimental emotions of individuals who think cremation lacking in sacredness, and too rapidly destructive. They fail to recognize the ultimate issue, that naught but ashes finally remain under the tomb, and that it can be erected over those which result from cremation with more enduring certainty than the grave, or the ashes can be taken care of as proposed by many other devices. But the new mausoleum process fully meets this sentiment, while it also overcomes the medico-legal objections urged against cremation, and, like it, effectually disposes of the dead without danger to the living.

I am sorry to have occupied the attention of the Society so long ; but this is a question which I have very much thought of, and, on being invited to be present to hear this paper read and to say a few words on the subject. I am much gratified with the opportunity. I am completely running over with thoughts of the danger to the living from the modern means of disposing of the dead, and sincerely hope that the day is not far distant when the public mind will be fully reconciled to the other and better means than interment which have been so well presented.

Dr. JOHNSON.—Mr. President : The question has been so thoroughly and exhaustively discussed by the writer that he has stolen all my thunder. There is only one point that I wish to speak about, and which is a point that comes close home to us. Dr. Bell has alluded to it : Why should we sacrifice the living on account of our emotional feelings for the dead?

There is one point that Dr. Peacocke alluded to in Pasteur, which I will speak of.

Pasteur's attention was called to the fact that anthrax arose in sheep grazing on a pasture where sheep had been buried some ten or twelve years ago. In order to verify that this was a reality and not an accidental thing, he caused a sheep to be inoculated with anthrax, or malignant pustule ; he had a hole dug ten feet deep so wide that the sheep would not touch the sides while the body was being lowered. It was brought into the pasture from abroad ; it was buried in the ground, rammed down, and a fence was put around it. The next summer, when the grass was growing, four sheep were placed inside of this fence, and a flock of sheep was placed outside of the fence in the pasture. Within forty-eight hours three of those sheep inside of the fence were dead with malignant pustule. None of those which were in the pasture inside of the fence escaped. His attention was called to the earthworms as a probable cause. He found by experiments that the earthworms were very fond of meat, and he took the castings that the earthworms deposited on the surface of the ground—he took those castings that were found in the enclosure—and put them into distilled water, and from this he propagated anthrax, with that he inoculated other sheep and destroyed them ; thus proving beyond a doubt that the earthworms were the cause of bringing the germs to the surface of the ground.

In 1822, when yellow fever was epidemic in New York City, the disease prevailed so frightfully around Trinity churchyard that the authorities ordered the Trinity churchyard to be covered with quicklime a distance of one foot in depth. The laborers who were employed in taking charge of distributing that quicklime took the yellow fever.

It has been shown that where these bodies are buried the deadly gases have forced their way several hundred feet through the ground into the cellars of adjoining houses, so that when people went down into the cellars with a light, the light would be extinguished by the carbonic acid gas.

There is one point that the writer has not mentioned, that some of the authorities have spoken of, and that is the disposal of bodies by burial at sea. That plan has been discussed, but I hardly think it is worth while to make more than a passing reference to it. The prospect of having the bodies of your relatives finding their way on your table in the fish you eat is hardly worth discussing.

When Dr. Bell and I first began practicing in this city, typhoid fever was a fall fever. To-day you cannot find one month in the whole year that typhoid fever is not in this city.

I took the trouble, some week or two ago, to go through the records of the Board of Health of this city, and it was an impossibility to find three consecutive weeks out of the whole last two years where typhoid fever was not in this city. It has come to stay. The Sanitary Superintendent took a great deal of pains in going over the record with me.

Where did the typhoid fever come from? It is a question that is coming home to all of us; and I think we can show that the burials on Long Island are every year giving us more and more to think of in this direction. The germ of typhoid fever is not destroyed by winter's cold.

The epidemic that was alluded to at Plymouth has been conclusive of that. They never had the typhoid fever in Plymouth, Pennsylvania, until that young man was brought home to his father's house. It was cold. He was sick from December till March, and the stools were thrown out on the snow. The ground was frozen so solid that the stools laid there. On the 25th of March, when the thaw took place, the water ran down the hill. Within six weeks twelve hundred cases and two hundred deaths from typhoid fever was the result.

To determine whether the germ was killed by the cold, Professor Prudden put the germs of typhoid fever in a mixture of salt and ice, and kept them in that mixture for one hundred and three days. At the end of that time he took those germs out and they propagated.

Professor Sternberg has kept germs of typhoid fever hermetically sealed for over a year, and at the end of that time he has propagated them.

Now, when we know that caustic potash will not destroy them, nor nitric acid, when they will survive the winter's cold and the summer's heat, when they are vegetable as much as the grains of wheat that have

been in the mummies for three thousand years and then have propagated, who can say that those three thousand years do not belong to them as much as to the grain.

Underneath the Hempstead Plains there is a plateau of water that filters in from the ocean. Before Garden City was purchased by Mr. Stewart, John Kellum, who was a patient of mine, had the geological surveys made. In Mr. Kellum's house there was a tank built that held 10,000 gallons of water. Windmills pumped the water up, and pipes delivered it over a hundred acres, and still it was impossible to take all the water from that well. All of the Hempstead Plains and all the land through there is a sandy soil. The germs of typhoid fever from bodies that are buried in that neighborhood can easily filter through the ground and be carried so as to permeate our water. Only a short while ago, at Ridgewood, we have been protected by the authorities from having our water contaminated by a Hebrew burial ground. Their present burial ground was not large enough, and they wanted to acquire another hundred acres of land. This would bring it up to our pumping stations.

I take leave to trespass upon the time of the Society by reading one case where typhoid fever germs were carried thirteen miles, where it percolated through oolitic stone. That this filtered through and was not an underground stream was shown from the fact that salt was put in, and the next day the salt passed through, so that the water was contaminated with the salt, and after the salt ran through clear; a day or two afterwards, flour was put there and it did not go through, and with it, iodine, which is a test of starch, failed to reveal any of it. The case is a little long, but it covers the question so thoroughly that I beg the pardon of the Society while I read it.

"The record of the outbreak at Lausen, in the Canton Baselland, in 1872, is of great value as illustrating this and other facts in the pathogenesis of enteric fever. From the time of the passage of the allied armies, in 1814, Lausen had suffered no epidemic of typhoid fever. Isolated cases had never spread the infection. During the seven years preceding 1872 not a single case of typhoid had occurred.

"This village is situated on the Jura, in the valley of the Ergolz, and consists of one hundred and three houses, with eight hundred and nineteen inhabitants; it was remarkably healthy, and resorted to on that account as a place of summer residence. With the exception of six houses, it is supplied with water by a spring with two heads, which rises above the village at the southern foot of a mountain called the Stockhalder composed of oolite. The water is received into a well-built covered reservoir, and is distributed by wooden pipes to four public fountains, whence it is drawn by the inhabitants. Six houses

had an independent supply—five from wells, one from the milldam of a paper factory.

“On August 7, 1872, ten inhabitants of Lausen, living in different houses, were seized by typhoid fever, and during the next nine days fifty-seven other cases occurred, the only houses escaping being those six which were not supplied by the public fountains. The disease continued to spread, and in all one hundred and thirty persons were attacked, and several children who had been sent to Lausen for the benefit of the fresh air fell ill after their return home.

“A careful investigation was made into the cause of this epidemic, and a complete explanation was given.

“Separated from the valley of the Ergolz, in which Lausen lies, by the Stockhalder, the mountain at the foot of which the spring supplying Lausen rises, is a side valley called the Furlenthal, traversed by a stream, the Furlenbach, which joins the Ergolz just below Lausen, the Stockhalder occupying the fork of the valleys. The Furlenthal contained six farm houses, which were supplied with drinking water, not from the Furlenbach, but by a spring rising on the opposite side of the valley to the Stockhalder.

“Now, there was reason to believe that, under certain circumstances, water from the Furlenbach found its way under the Stockhalder into one of the heads of the fountains supplying Lausen. It was noticed that when the meadows on one side of the Furlenthal were irrigated, which was done periodically, the flow of water in the Lausen spring was increased, rendering it probable that the irrigation water percolated through the superficial strata, and found its way under the Stockhalder by subterranean channels in the limestone rock. Moreover, some years before, a hole on one occasion formed close to the Furlenbach by the sinking in of the superficial strata, and the stream became diverted into it and disappeared, while shortly after the spring at Lausen began to flow much more abundantly. The hole was filled up, and the Furlenbach resumed its natural course.

“The Furlenbach was unquestionably contaminated by the privies of the adjacent farmhouses, the soilpits of which communicated with it. Thus, from time immemorial, whenever the meadows of the Furlenthal were irrigated, the contaminated water of the Furlenbach, after percolation through the superficial strata and a long underground course, helped to feed one of the two heads of the fountain supplying Lausen. The natural filtration, however, which it underwent rendered it perfectly bright and clear, and chemical examination showed it to be remarkably free from organic impurities; and Lausen was extremely healthy and exempt from fevers.

“On June 10th, one of the peasants of the Furlenthal fell ill with

typhoid fever, the source of which was not clearly made out, and passed through a severe attack, with relapses, so that he remained ill all the summer; and on July 10th a girl in the same house, and in August a boy, were attacked. Their dejections were certainly, in part, thrown into the Furlenbach, and, moreover, the soilpit of the privy communicated with the brook. In the middle of July the meadows of the Furlenthal were irrigated as usual for the second hay crop, and within three weeks this was followed by the outbreak of the epidemic at Lausen.

"In order to demonstrate the connection between the water-supply of Lausen and the Furlenbach, the following experiments were performed: The hole mentioned above as having on one occasion diverted the Furlenbach into the presumed subterranean channels under the Stockhalder, was cleared out and eighteen hundred-weight of salt were dissolved in water and poured in, and the stream again diverted into it. The next day salt was found in the springs at Lausen. Fifty-six pounds of wheat flour were then poured into the hole, and the Furlenbach again diverted into it; but the spring Lausen continued quite clear, and no reaction of starch could be obtained, showing that the water must have found its way under the Stockhalder in part by percolation through the porous strata, and not by distinct channels."

The evening is so late and there are so many other speakers to follow me that I do not feel like trespassing longer upon your time in covering any further point. I will simply mention that I have conclusive evidence that the germs of typhoid fever have been carried down the Ohio River eight hundred miles, and Cincinnati has been contaminated by the water-supply. The evidence produced by men who have studied that question is so clear and overwhelming, and our population increases so wonderfully, and as our burying grounds are going to increase, and it is certain that these germs are living for a long time, which has been alluded to, that I think for the preservation of the living the dead should be cremated.

Dr. G. W. BRUSH.—I find myself in much the same position as the preceding speaker. When, a few days ago, I was asked to say a few words on this subject at this meeting, I gathered a few facts; but the essayist of the evening has been so exhaustive that he has covered all the points I had in mind, with the exception perhaps of one.

I think the medico-legal and sentimental sides of the question have been fully covered. There is just one point, in connection with the religious aspect of the question, that I think has not been fully covered, and I will occupy just a few moments on that.

We find, in looking back into the history of the past, that this

whole question of the disposal of the dead is closely allied to the religious beliefs of the inhabitants of the world.

The Egyptians, some two thousand years before the Christian era, were in the habit of embalming their dead, and one of the reasons was that they believed that after death the soul left the body and performed a certain cycle of existence, dwelling in the bodies of animals and other beings as a method of punishment, finally, after from one to three thousand years, coming back to inhabit the original body, which should from thence be immortal; hence their great care to preserve the body in the best manner possible then known to science.

We find, as the essayist has said, that the Romans practiced cremation of the dead. There came a time, however, when it ceased practically, and that time was about four hundred years after Christ, when into the Christian religion there came a belief in the resurrection of this physical body, and this belief still lingers at the present time, as evinced by the case cited by the essayist, of the lady in Massachusetts, who daily visits or sends messages to the tomb of her dead husband. The inference is, she believes that the living being is still in some mysterious way connected with or related to the body it inhabited during life here on earth. And this is not an isolated case. I remember hearing a sermon in this city only a few years ago in a prominent pulpit on the subject of the resurrection, and the speaker, who seemed an intelligent man, enunciated his belief in the actual resurrection of the physical body, and pictured parts of human bodies, legs, arms, and hands, flying through the air on resurrection morn, each part seeking out its associated part, coming from battlefield and cemetery and ocean, a representation that seemed to me absurd and shocking in the extreme.

It seems difficult to believe that such things could be soberly uttered in this enlightened age, but that man actually believed what he preached; at all events he preached it with unction. While I believe in a resurrection of the *dead*, I do not find it anywhere taught in the Bible that this actual body is raised from the dead.

Until we get rid of these heathenish notions of the past we cannot hope to bring about this reform that is so important to the living—this method of so disposing of the dead that the living may be protected from the germs of disease by their destruction. If, as has been demonstrated here to-night and elsewhere by those who are carefully studying the subject, there is good ground for believing that the germs may lie dormant for an indefinite length of time and still possess the power of propagating disease when brought into right conditions for germination, the danger of burying bodies containing myriads of contagious disease germs cannot be estimated. The common impression is that

Mother Earth covers up and destroys all germs of disease; but it has been shown that many of these germs live without air, and, like the grain of wheat found in the Egyptian mummy, they may spring into life after many years. If the future investigations of science shall prove some of these things to us beyond all question or room for dispute, the question of the disposal of the dead is all-important. If we would have cremation looked upon with favor, we must destroy the idea that that which we call the soul, the living being which inhabits this body as a temporary tenant, has any further use for it after life has departed from it.

Of course it is hard for us to realize that the form of one that we have loved is simply clay, nothing more nor less than a few chemical elements that must be resolved back into their original or some other form, and that the living being we have loved is not there. Even some who believe in cremation might shrink from it when it came too close home; but once convinced of the truth of the complete and final severance of soul and body, the strongest objection to cremation will be removed.

I am in sympathy with the essayist theoretically; but cremation is an innovation upon present customs, and will not prevail except in individual instances for a long time to come.

There is another branch of the subject which ought not to be overlooked that this moment occurs to me, and that is the cremation of the bodies of animals, and all kinds of refuse found to carry disease germs, whether animal or vegetable. We find upon our sidewalks and elsewhere, on hot days, boxes and pails filled with festering and decaying material that may spread disease in all directions; and it seems to me that it is very important that all of this be disposed of by some method, so that it shall not offend the senses and endanger health, and for this purpose fire is our best germicide.

DR. GRIFFIN.—I came here simply to listen to the discussion of the evening. I am not at all prepared to take part in the discussion, and would rather you had not called upon me. Now, however, that you have invited me to speak upon the subject, I shall refer to an assertion made by one of the gentlemen. I allude to the alleged existence of a hurtful disease in this city at all times and at all seasons. If the hypothesis upon which his theory is based be correct, this community would not be a place fit to live in. The summer season, the high temperature, the changeable weather, all present the most favorable conditions for the development of the disease, assuming the possibility of its continued presence; and I think it would be well that the fact should be more carefully and thoroughly sifted and examined before any such statement should be presented to the public.

The features of the paper presented, and the discussion by the gentlemen, emphasize the possibility of the spread of typhoid fever through the proximity of cemeteries and burying grounds to the sources of supply of our water. This certainly will not hold in Brooklyn, whatever the facts may be in other cities.

In one instance referred to, that of the Jura Mountains, the condition of the locality, the geological formation, were all favorable to the spread of the disease. Here on our island it is not so.* The nature of the soil, the care taken in relation to the sources of our water-supply, the absence of cemeteries along the streams that supply us, protect the community from any such danger as has been pointed out.

The elevation of this island is so little above the surrounding waters that it is not possible for impurities from cemeteries, in following the natural course of gravitation, to reach our supply; and it is impossible that the soil could be contaminated so that poisonous germs could reach the surface, as described by Dr. Johnson in the instance in which he speaks of the destruction of the sheep that were pasturing upon the grass above the spot where the infected body was buried. The possibility of permeation by pressure of the water through the long conducting channel or tube, which is so thoroughly protected and through which the water passes prior to its collection into the reservoirs that supply the city, is not to be seriously considered, and pollution from such cause is not sufficient to endanger the lives of the people.

Dr. JOHNSON.—As the doctor who has just spoken has not had time for preparation, I would respectfully request that he be kind enough to make preparation by getting one of his clerks to make a transcript of the number of typhoid fever patients during the past three years, and the number of weeks we have had in which there was no typhoid fever in the whole year. The fever has come to stay. You cannot put three weeks in succession without having it. And what is the one explanation the Board of Health can give of the cause of it?

Dr. RAYMOND.—It seems to me that the weight of evidence at the present time is strongly in favor of cremation, and yet there are some arguments which have been used by those who advocate this practice which are hardly justifiable. One of these arguments is the expense of the funeral services in connection with earth burial. This is hardly a fair argument. Because people insist upon spending a large amount of money for rich and expensive caskets, and choose to array themselves in expensive mourning, is no argument against the present method of disposing of the dead.

We may readily imagine that if the time ever comes when cremation is the generally accepted method, instead of having these cheap

clay or alabaster urns, to which reference has been made, the friends of those who have been cremated will insist upon having the urns made of gold or silver, and we can readily understand that when this method of the disposal of the dead becomes fashionable, the amount of money that can be expended in funerals of that kind may be at least equal to that expended now. That argument, therefore, is not a valid one, and should not be used by advocates of cremation.

The reference that has been made to Freire's discovery of the yellow fever germ in the graveyard should not have any weight, inasmuch as neither Freire nor anyone else has as yet discovered the yellow fever germ, either in graveyards or elsewhere, and Freire's claim is not recognized by bacteriologists generally.

The essayist of the evening leaves us in doubt as to exactly which of the methods of disposal he favors, cremation or desiccation. I wish he had been more explicit on that subject. I am inclined to the opinion that he is rather in favor of desiccation. If that is true, one of the arguments which he has used against earth burial would be applicable also, it seems to me, there. The germs of disease certainly would not be disposed of by the simple process of desiccation. If the grain of wheat could live in the mummy for three thousand years, we can imagine that the simple removal of the moisture from the body would not be sufficient for the removal of the germs; so that the great point which is made in reference to the benefits of cremation, the destruction of the germs, would be a weightier argument in favor of cremation than of desiccation.

Reference has been made here to-night to the propagation of typhoid fever by water. I suppose there is no one who is at all familiar with the subject who will deny for one moment that epidemics have over and over again been caused by water. It has been recognized that water is one of the principal means by which typhoid fever has been spread. But for some reason the attention of experts seems to be so fixed upon water that they have shut their eyes to everything else.

Now, I for one do not believe that water has anything to do with the typhoid fever in the City of Brooklyn. If you will look at the history of epidemics where water has been distinctly recognized as the cause of the epidemic, the number of people who have been affected has been very large compared with the population. At least that is the impression which I now have, derived from my study of the literature. In the epidemic of Plymouth, a town which contained 8,000 inhabitants, 1,153—more than one-eighth—were affected with typhoid fever. In the instance which Dr. Johnson refers to, where 130 persons were affected, in a population of 819, the 130 represents a considerable percentage of the population.

Now, that is not the case in Brooklyn. If typhoid fever in Brooklyn were produced by the drinking water, instead of our having sometimes two or three, and sometimes no cases at all in a week or a month, we should find a very different state of affairs. Here in the City of Brooklyn we are all drinking the same water, coming from practically the same source, all mixed in the same reservoir and distributed to our houses through the same pipes. I have always been impressed with the close relation between the spread of typhoid fever and infected water, and when I was in the Health Department, this was one of the strongest arguments which I used in urging the removal of the street pumps. Out of the 316 pumps which we had in the beginning, there was at the close of my term of office but one pump in the city, and that was not removed because its water was always found to be in good condition. But, although the use of pump water has been discontinued, typhoid fever has not diminished as it should have done had it been due to infected pump water, and so we are compelled to abandon the theory that our pump water had much if anything to do with typhoid fever.

Reference has been made to the fact that to-day typhoid fever is much more prevalent in Brooklyn than it ever was before. That same statement was made in 1885. I took the trouble then to look over the record, and found that that was a mistake. We went back some fifteen years and found its fatality was about as great in previous years. I have not prepared the figures of late years with reference to our population, but I have no doubt that if we should make an examination of that kind we should find that the increase is not so much greater as is stated and generally believed.

The statement has also been made here to-night, that formerly we had but little typhoid fever in Brooklyn, except in the fall. The idea that was conveyed to my mind in the statement was that whereas formerly typhoid fever was purely a fall fever, almost unknown in the spring and in the summer, now we find it throughout the year. I have some figures on that point which I think will satisfy us that that is an error.

In the month of January, 1877, there were three deaths from typhoid fever; two in the same month in 1878; five in 1879; six in 1880; four in 1881; ten in 1882; four in 1883; and six in 1884; so that from 1877 to 1884 there were forty deaths in the month of January.

In the months of February, of the period from 1877 to 1884, there were twenty-eight deaths. In March, there were forty-one; in April, thirty-three; in May, thirty-eight; in June, thirty-seven; in July, thirty-three; in August, seventy; in September, ninety-nine; in

October, ninety-one; in November, sixty-six; and in December, fifty-one.

It is true that these figures show that typhoid fever prevails mostly in autumn, but they also show that it is present throughout the year. It is especially an autumnal disease beyond question, but not entirely so.

I have looked in vain, from 1877 to 1884, to find in any month of the year an absence of death from typhoid fever. In 1883, however, there were no deaths from typhoid fever in the month of June.

In 1884, there were six deaths in January; in 1882, there were ten deaths in January; in the same month of 1889, this year, there were seven deaths; and in the same month last year, 1888, but six deaths. In but two years from 1877 to 1884, in the month of March, were there less deaths than three. In some of those years it ran up to nine; whereas last year there were but three deaths in the month. So that the statistics from 1877 to 1885—and I take those years simply because I had the tables handy, they were not selected years—I find no period of time, no month in the year when typhoid fever did not exist in Brooklyn.

It seems to me that we have an opportunity here in Brooklyn for settling a very important question. I do not know of any city in the world where the conditions for the investigation of typhoid fever are what they are in Brooklyn. I believe that if this Society would make a request of the Health Commissioner that the subject of typhoid fever be specially inquired into in Brooklyn, he would see if something could not be done to ascertain its cause. I think the water question can be excluded. I believe now, as I believed in 1885, that we find in our sewers and defective plumbing the important agents in the continuance and spread of typhoid fever. I may be wrong, but if I am, I should be glad to be corrected. I believe water has nothing whatever to do with it; and I base that belief upon this, that if our water were at fault, instead of having cases in the small numbers that we have, we should have them by the thousands.

Dr. EVAN F. SMITH.—I would like to call the attention of the Society to one seemingly peculiar fact, as long as this question of water pollution has been called up, and it is this:

In the mountain regions of the West, in the Sierras, we may call them, of our country, there is a good deal of what is known as "mountain fever," and the hunters and trappers and miners that exist sometimes for weeks and months at a time in these elevated portions of the country, are stricken down with what is to my mind a disease identical in many respects with typhoid fever. I have seen them, and have been unfortunate enough to lose some cases where they have presented every characteristic of typhoid fever. These people, who

reside in this elevated section of our country, miners, or men who are surveying railroad routes, use the water that runs in streams from the mountains. And it is so also in the smaller towns that are built in different sections of the country, 3,000, 4,000, or 5,000 feet above the level of the sea, where their water supply comes from the rivers which run from the mountains, and in many cases form a portion of it. Through all this arid region, especially the mountainous portion of it, this so-called mountain or typho-malarial fever exists. In these cases there appear the same tympanites, and the same lesions of Peyer's and the mesenteric glands, and the fever runs about the same course, and possesses about the same types as may be seen in a clearly defined and typical case in the East.

The water supply is obtained from springs and brooks, as well as the larger streams and rivers, which in most instances have a course of only a few miles from their source to the point where the water may be used. In towns and villages which have been settled but a few months or years we see these fevers occurring in large numbers of cases, as compared to the population. That the *pathogenic element* resides in a *living agent*, which originates either in man or external to him, and is developed and proliferated within his intestines, poisoning the organism, there should not be the least doubt in the minds of any scientific, well-educated practitioner of medicine.

AN OPHTHALMO-DYNAMOMETER.

BY L. A. W. ALLEMAN, M.D., BROOKLYN, N. Y.

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The study of the ocular muscles, and of their influence in the production of certain ocular and nervous phenomena, has of late received no little attention from students of ophthalmology. As a result, I think it is now quite generally admitted, that these muscles may become a very important factor in the production of headache, of very distressing and persistent asthenopia and of a train of obscure, reflex nervous phenomena which often tax to the utmost the skill and patience of the surgeon under whose observation they may fall.

Whenever either from intrinsic lack of power or from insufficient innervation the ocular muscles are unable to maintain, without effort, their normal equilibrium, and binocular fixation of any point within the normal range of convergence is no longer easily possible, then very annoying symptoms, depending largely in intensity upon the nervous susceptibility of the patient, are almost sure to follow.

It oftentimes happens that this eye strain manifests itself in reflex phenomena, and no symptoms are present pointing to the eyes. These cases will apply for relief to their family physician, and upon his ability to recognize the true source of irritation depends his ability to relieve his patient. I trust, therefore, I shall be pardoned if I briefly allude to some simple tests for muscular insufficiency, and in describing the instrument which I have devised for measuring convergence and accommodation, if I enter more into detail than would be necessary in presenting the subject to men who have made this department of medicine a special study.

In some cases, muscular troubles are very easy of detection, in others they can only be demonstrated after repeated and most careful examinations; hence, one may feel sure that if he has discovered a lack of equilibrium by the tests at his command, he has found a very probable cause for the symptoms. But it must be remembered that it does not follow with equal certainty that when no lack of equilibrium is found muscular trouble does not exist.

One of the simplest tests for lack of equilibrium is to place before one eye, preferably the one with the greatest visual acuity, a red glass, and direct the patient to look at the flame of a candle twenty feet distant. Should diplopia exist, you have muscular trouble of a considerable degree. Again, place before one eye a prism, say, of 5° , with its base either up or down, and again direct him to look at the candle. The two images should stand directly one over the other. When this is not the case, the one set of muscles overbalance the other, to an extent which is usually measured by the prism, that, placed with its base either to the nose or temple, will again bring the images in a line.

Again, with the eyes directed towards a candle flame, place a prism, 10° will usually suffice, with the base to the nose, the images will then be separated in the horizontal, and in like manner should keep the same plane.

The method of measuring the power of muscles most frequently employed, is, I think, the one by determining the strength of prism which the patient can overcome. For example, to determine the strength of the externi, prisms with their bases toward the nose are placed before the eye, and the strength of the prism increased till the strongest prism is determined through which the patient is able to see clearly, and overcome the tendency to see double images. This prism is put down as the measure of his muscular power. This method is open to many objections, especially in measuring the power of convergence. It is extravagant of time, and is so fatiguing to the patient, that in some susceptible subjects its application is almost

impossible. It requires no little intelligent co-operation on the part of the patient; in fact, the knack of overcoming prisms has to be learned by the patient, and, as a rule, when the prism test is made at several successive examinations, we find that the strength of prism overcome increases at each trial, showing that the result is a measure of the patient's power to exercise his muscles in response to our experiments, and not of his total muscular power.

An instrument made by two superposed prisms, so arranged that by rotation the strength of the prism can be gradually increased, offers this advantage over the simple prism, that the patient is more easily induced to exercise up to the limit of his ability, when the strength of the prism employed is so gradually increased that the double images are never suddenly and widely separated. Double images, when standing very near together being more annoying, the effort to fuse them is proportionately greater. But this instrument is clumsy of manipulation, and has the disadvantage of being placed before only one eye, making it more confusing to the patient, but on the whole, I think it is the best instrument for measuring divergence, and if two pairs of such prisms were used, mounted in a frame, and so arranged as to be rotated simultaneously before each eye, it would be still more satisfactory. But for measuring convergence, it is open to the same objection as all prism tests. It either necessitates making the test at twenty feet, and thus compelling the patient to dissociate convergence and accommodation, which are habitually and normally associated, or, if made at the the near point, so strong a prism is required, that very annoying distortion and chromatic effects are produced.

The ophthalmo-dynamometer of Landolt, which measures convergence by determining how near an object can be brought to the eye without producing diplopia, offers, I think, by far the best method at our command for determining the converging power. But this instrument is not altogether free from objections. The candle is a decided inconvenience, the measurements can only be taken very approximately, and as in taking the measurements, the surgeon is compelled to stand by the patient's side, it is impossible for him to fulfill what seems to me to be one of the chief indications in making the examination,—that is, to watch from in front of the patient the movement of the eyes in convergence; for I think it is frequently the case, that we obtain quite as important information by observing the jerky, halting movements in convergence, as by learning the total converging power.

I have attempted to construct an instrument upon the same general principle as that of Landolt, which will give us a measure of the power of convergence in its physiological harmony with the power of accommodation, and at the same time be both accurate and convenient.

The instrument consists of a base which supports a brass tube, having at one end a metal block to which are attached lens holders, *a a*. From the block extends a rod upon which the square tube, *b*, slides. At the end of *b*, a yoke extends out on either side of the lens holders, carrying at the extremities upright pins, *c c*. From the lower side of the tube, *b*, extends an arm, connecting with a screw moved by the milled head, *d*, by the rotation of which the pins can be advanced or withdrawn from the lens-holders. Upon the tube, *b*, slides a carrier supporting the target holder, *e*, which is a triangular box, having upon

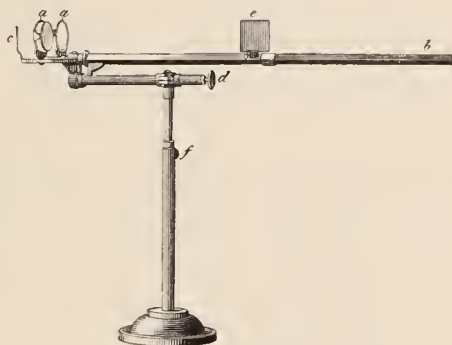


FIG. I.—This instrument is manufactured by Mr. W. E. Gibbs, 111 Liberty St. N.Y.

one side a blackened surface with a highly polished needle placed vertically in the centre; on one of the other two sides are test letters; and on the third side an astigmatic dial. The tube is graduated so that at the front of the carrier you read on one side the distance from the pins to the target in fractions of a metre, *i. e.*, metre angles or dioptries; on the other side, the same distance in inches.

In using the instrument to measure convergence, seat the patient in a comfortable position before it, and adjust it to the required height, fastening it in the desired position by the screw, *f*. Let the patient look through the lens holders, resting against the bridge joining them, and then rotate the head, *d*, till the pins are on a line with the front of the corneæ, which point is sufficiently accurate for all practical purposes, and is much easier of determination than the centre of rotation of the eye. Now advance the target holder, which, at the beginning of the examination should be placed at the extremity of the tube farthest from the patient; direct the patient to look steadily at the needle, and to observe at what point it becomes double. When this point is reached, withdraw the target till the patient is again able to see a single image; that is, to the near point of convergence. Then read at the front of the target the number of metre angles of convergence which the patient possesses.

In making this examination, the surgeon should stand in front of the patient, and should watch the eyes most attentively. If they are seen to converge with a halting, hesitating movement, it shows a lack of proper tone in the converging muscles. It should be further observed, whether, when the near point is reached, one eye quickly diverges, showing that the extreme convergence was reached by a great nervous effort.

It is always well to allow the patient to fix the needle for a short time at the near point, to avoid mistaking a degree of convergence reached by such a spasmodic effort, for the actual converging power at the patient's command. When there is a marked difference in the visual acuity of the two eyes, it is well to place a red glass before the best eye, as it serves to make the patient attentive to the second image.

Should the patient be unable to fuse the two images when the target is at the greatest distance from the patient which the length of the instrument will allow—40 centimetres—place in the lens-holder the two 11° prisms which accompany the instrument, with their bases toward the nose. These will add 3 m. a. of convergence. Now bring up the target, and determine the near point as before, deducting 3 m. a. from the total convergence.

When the prisms will not unite the images, divergence exists of such a degree that it can be best measured at 20 feet with a candle flame.

If the patient can fuse the images when the target is advanced as near as possible to the eyes, the prisms can again be used, with their bases to the temple, and 3 m. a. added to the convergence.

It is well in any case where muscular insufficiency is suspected, and where it is not shown to exist at the first examination, to repeat the examination at a subsequent visit, to avoid any possible error.

This determination of the punctum proximum of convergence is of the greatest practical importance in arriving at a correct diagnosis in any case of asthenopia or of obscure nervous trouble.

By experience it has been found, that in order to do near work and escape fatigue, a patient must not use more than a quarter or a third of his total converging power. Now when a patient presents himself in whom it is desired to determine whether his symptoms are due to muscular strain, first find at what distance he is in the habit of working; for example, say he is using his eyes for work one-third of a metre distant, and consequently using 3 m. a. of convergence, if upon examination with the dynamometer we find he has less than 9 m. a., we have discovered a sufficient cause for asthenopic symptoms; should we, however, find he has 10 or 12 m. a. of convergence, we know that

he can use the 3 m. a. required for his work and still keep three or four times that amount in reserve; we must then seek some other cause for the symptoms. As a general rule, any patient possessing less than 9 m. a. of convergence will suffer from muscular asthenopia.

The instrument is also equally useful in determining the power of accommodation.

We now turn the side of the target upon which the test letters are placed, toward the patient and bring to the nearest point at which they can be clearly seen.

Letters of different sizes are provided, the larger being useful in cases where the visual acuity is low. Having found the nearest point at which the letters can be recognized, the graduations will read as before, only substituting dioptries for m. a. A graduation in inches is also added for the convenience of those using that system.

I find the instrument very convenient in determining the glass required in presbyopia. The total accommodation is easily determined; here we find, according to Landolt, that one-third of the total power is sufficient to leave in reserve, and knowing the distance at which we wish our patient to work, we at once obtain the glass required by deducting the available accommodation from the glass required to bring his vision to that distance. I do not recommend this or any other method of fitting glasses by rule as alone sufficient; having determined the required glass in this way, the surgeon will of course so modify it as the requirements of the case and his other tests may indicate.

The usefulness of the astigmatic dial is apparent without comment. I find this optometer very convenient in determining whether a patient to be examined is fully under the influence of atropia; and also in determining any deficient power of accommodation which we not infrequently find in over-worked and under-nourished patients.

A word of explanation as to the metre angle taken as the unit of measurement may not be amiss. It is the metre angle (*metrewinkel*) of Nagel, and one metre angle (1 m. a.) the unit, is the angle of convergence necessary to fix simultaneously with both eyes an object situated on the median line at the distance of one metre from the eye. In any given case, the convergence is inversely proportional to the distance between the object fixed and each of the eyes; for example, to fix an object at one-half of a metre would require 2 m. a. of convergence; at one-third of a metre would require 3 m. a., and so on.

By reference to Fig. II. this is easily demonstrated.

Let half the base line, O M, be designated by b , and the distance O C', from the eye to the object by C'. The angle of convergence is in this case O C' M. It is determined by the expression,

$$\text{Sin. } O C' M = \frac{b}{c'}$$

or, $b = C' \sin. O C' M$.

We can construct rectangular triangles, $O C' M$, $O C'' M$, $O C''' M$, $O C'''' M$, whose common base is b ; from these we derive the formulæ.

$b = C' \sin. O C' M = C'' \sin. O C'' M = C''' \sin. O C''' M = C'''' \sin. O C'''' M$. For the small triangles with which we are dealing, the sine may be regarded as equal to the angle, and equation becomes

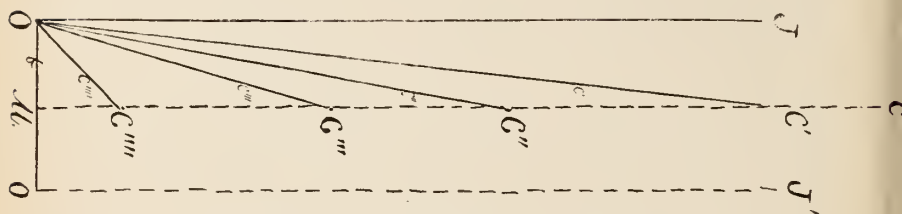


FIG. II.—Cut and explanation from Landolt.

$$b = C'. \quad O C' M = C''. \quad O C'' M = C''' \quad O C''' M. \text{ etc.}$$

Letting $b = 1$,

$$\text{Angle } O C' M = \frac{1}{C'}$$

$$\text{Angle } O C'' M = \frac{1}{C''}$$

$$\text{Angle } O C''' M = \frac{1}{C'''}$$

$$\text{Angle } O C'''' M = \frac{1}{C''''}$$

that is, the angles of convergence are inverses of the distances of the object from the eye.

If $C' = 1$ metre, the corresponding convergence is $C = \frac{1}{1} = 1$ m. a.

$$C' = \frac{1}{2} \text{ m.} \quad \text{“} \quad \text{“} \quad \text{“} \quad C = \frac{1}{\frac{1}{2}} = 2 \text{ m. a.}$$

$$C' = \frac{1}{3} \text{ m.} \quad \text{“} \quad \text{“} \quad \text{“} \quad C = \frac{1}{\frac{1}{3}} = 3 \text{ m. a.}$$

$$C' = \frac{1}{4} \text{ m.} \quad \text{“} \quad \text{“} \quad \text{“} \quad C = \frac{1}{\frac{1}{4}} = 4 \text{ m. a.}$$

The results obtained with prisms in testing divergence may be easily reduced to the same notation, for the deviation produced by a prism is equal to half its angle of opening. A prism X° produces a deviation of $\frac{X^\circ}{2}$ or $\frac{X \times 60'}{2}$; dividing this by 110', the value of the metre angle ($1^\circ 50'$) for a base line of 64 mm., the equation becomes $\frac{X \times 60''}{2 \times 110} = \frac{X \times 3}{11}$; when held before only one eye, and its action divided between the two, we have $\frac{3 \times X}{22}$; with a base line of 58 m. we have $\frac{3 \times X}{20}$, the average $\frac{3 \times X}{20} = \frac{X}{7}$. That is, we may obtain approximately in metre angles the deviation produced in each eye when a prism is held before one by dividing the number of the prism by 7.

COTTONSEED PRODUCT.

BY DR. SHEETS.

Read before the Kings County Pharmaceutical Society, June 11th, 1889.

I have hastily written a few notes on a new substance for culinary and pharmaceutical purposes, which I wish to introduce this afternoon to your attention. Doubtless some of you have already seen it, and may have been furnished samples.

It is called cottonseed product, and is composed of refined cottonseed oil and beef fat. The proportions, I think, are three-fifths of the former to two-fifths of the latter. It is of a yellowish color, a little lighter shade than vaseline, of a tolerably firm consistence, possessing in this consistence an advantage over lard, for which it is offered as a substitute. I have not tested its melting point, but from its behavior I am inclined to think it considerably higher than lard, which we know becomes semi-fluid during the heat of summer unless kept in a cool place.

I do not propose to enter into extended details concerning this new product, but merely wish to draw your attention to it, so that those who have the time and inclination may examine its merits more fully.

A few weeks ago a sample was left me to test in the kitchen. It was used in pastry, frying fish, etc., and we were delighted with the

results. While fish were frying there was no empyreumatic odor filling the house, which is disagreeable to the olfactories where lard is used. The pastry was perfectly sweet and bland; no disagreeable taste of lard or unpleasant sensations in the stomach.

After using it in the kitchen it occurred to me that it might be a good basis for ointments. Accordingly, I made a small sample of oxide zinc ointment, which I now show you. This ointment was made on the 22d ult.

The ointment made with lard is apt to granulate, grow rancid, and become semi-liquid in very warm weather. I am inclined to think this made with the cottonseed product will not do so, but of course it has not a sufficiently lengthy test.

It is time we had other bases for ointments besides lard, as vaseline, petroleum, glycerine, paraffin, lanolin, etc. Some are unalterable, but are not readily absorbed, when that is desirable; others are easily absorbed, but deteriorate by keeping; and some are utterly spoiled, as lanolin, which becomes black and emits a foul odor.

The price of this article is very little more than lard, and for culinary purposes it is said to require a less quantity.

This company also manufactures a soap, which looks very well, and ought to be much purer than many of those on the market made of dirty fats and oils.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

THE HOAGLAND LABORATORY.

The Trustees of the Hoagland Laboratory make the following announcement. Dr. George M. Sternberg, U. S. A., will continue as General Director of the Laboratory. George T. Kemp, Ph.D., Johns Hopkins University, will be Associate Director of the Departments of Physiology and Experimental Therapeutics. Dr. B. Meade Bolton has been appointed Director of the Department of Bacteriology, and will assume charge of that department in September.

Drs. Sternberg and Kemp are already well known to the profession of Brooklyn, and of them we need only say that their continuance with us is a matter for congratulation. Dr. Bolton, although well known to the scientific world, is a stranger to Brooklyn. We shall, however, accord him a most cordial welcome on his return from Europe, whither he and Dr. Kemp have gone to examine into the most recent bacteriological and physiological methods. As Dr. Bolton is to be a resident of Brooklyn for at least three years, a brief account of his life will be of interest to our readers.

B. MEADE BOLTON, M.D.

Dr. B. M. Bolton is a native of Virginia and pursued a thorough academic course at the University of Virginia, and was afterwards graduated there with the degree of doctor of medicine. He received an appointment as physician to the Richmond City Dispensary, and practiced his profession with marked success for three years in Virginia and Mississippi. In 1882 he was appointed a tutor in English and mathematics at the South Carolina College. While acting in this position he pursued post-graduate courses in laboratory chemistry. In June, 1883, he went to Europe and studied chemistry under Bunsen at Heidelberg, and physiology, hygiene, histology and bacteriology at Göttingen, Wurtzburg and Berlin under such great specialists as Flügge, Krause and Koch. In October, 1886, he was appointed an

assistant in bacteriology and pathology in the Johns Hopkins University. Thence he went to the University of South Carolina, where he occupied the chair of physiology and hygiene until he was called to the Hoagland Laboratory. Perhaps we can in no better way give our readers an idea of his qualifications than by quoting from the opinions of those who know him best.

Dr. Welch, professor of pathology of Johns Hopkins University, writes: "It gives me pleasure to recommend, unhesitatingly, Dr. Bolton for these positions (the chair of physiology and hygiene and bacteriologist to the experiment station), as in my judgment the best qualified man for these departments to be obtained in this country. A personal acquaintance with Dr. Bolton and intimate association with him for the past two years have enabled me to form an estimate of his capacity, training and character. His opportunities for special training in his chosen fields of study have been exceptional; his zeal and enthusiasm in his work are guarantee of his future success. Dr. Bolton is already a recognized authority in matters pertaining to bacteriology. We part with him, should he be promoted by your choice, with great reluctance, for he has proven himself a most satisfactory and efficient member of the teaching corps of this university."

President Gilman of the same university, says: "I concur in the estimate of his ability, attainments and character expressed by Prof. Welch. His opportunities in his chosen department of medical and biological science have been exceptionally good, and his talents and habits have enabled him to make the best use of such advantages."

Dr. Buck, the distinguished author of the "Handbook of the Medical Sciences," for which work Dr. Bolton, at the request of the author, prepared an elaborate article on the Schizomycetes, writes: "Having had unusual facilities for several years past for learning who are the strong men in our profession in the different departments of scientific and practical work, I feel no hesitation in saying that I do not know of a stronger candidate for the position in question than Dr. Bolton."

Dr. Koch, the renowned bacteriologist and professor in the University of Berlin, says: "Dr. Bolton distinguished himself by the zeal and skill displayed in bacteriological investigations in the hygienic institute of the University of Berlin."

Dr. Flügge says: "I had always the greatest pleasure in his industry, skill and love for scientific truth during the three sessions he worked in my department. I am convinced that he will show himself thoroughly capable of teaching bacteriology and hygiene with success."

Dr. Krause states: "During the time Dr. Bolton worked in my laboratory he acquired an extraordinary knowledge of animal and

vegetable parasites, as well as of the finer methods of microscopic investigation. I consider him highly qualified to hold a professorship of hygiene and bacteriology, and have full confidence in his skill and trustworthiness in dealing with the often difficult problems of this branch of science."

Dr. Bolton has already done a large amount of original research in bacteriology, numerous references to which will be found in current literature and in the Report on Disinfectants of the American Public Health Association. Dr. Bolton is now serving on the U. S. Board of Inquiry covering epizootic diseases of swine.

FILTERS AND THEIR DANGERS.

Dr. Chapin, Superintendent of Health of Providence, in his last annual report, discusses at length the epidemic of typhoid fever which prevailed in that city during the year 1888. Having reason to suspect the water-supply as connected with the causation of the disease, he caused biological examinations to be made, but without success. Thinking that the typhoid bacilli might have been in the water at the time the sickness occurred, and absent at the time of the examination, he determined to look for them in the filters, and for this purpose submitted filters, which were in houses where typhoid existed, to Dr. Swarts of Providence, Dr. T. Mitchell Prudden of New York, and Dr. Harold E. Ernst of Harvard. In three of these filters typhoid bacilli were found. As these results are fraught with so much importance, and as they are likely to be classical, we quote the language of Dr. Chapin in full. He says: "The bacteriological investigations of Dr. Swarts, the Medical Inspector, which I briefly referred to in my last report, have made it certain that the house filters in common use collect filth and microbes from the water and act as incubators for the latter, allowing them to rapidly propagate within the interstices of the filtering material, and they are washed out in large numbers as water is drawn through the filter. Such filters have been invariably condemned by me, for it seemed certain that in case there were disease germs in the water, the so-called filters, instead of removing them, would actually increase the amount of the poison, and so increase the liability to disease in those who used them. Events seem to have shown this view to be correct, for although I have done all I could to discourage the use of filters, they have been largely relied upon to furnish the consumers of the city with pure water. During this epidemic a large number of patients were found who had used water thus

filtered, and it was especially noticeable that many of the cases which occurred soon after the epidemic proper had ceased, made use of filters, and it is, I think, highly probable that the poison was preserved and increased in amount in these filters.

"It was determined to examine these filters—taken from houses where there was typhoid—to learn whether or not they contained the specific organism. As the labor of examining such an enormous number of organisms as were found in the filters is very great, only a few filters were tested. Dr. Swarts examined some, and some were sent to Dr. T. Mitchell Prudden, of the College of Physicians and Surgeons, New York, and others to Dr. Harold E. Ernst, of Harvard, all gentlemen thoroughly skilled in bacteriological work. It must be remembered that all these filters were found to be filled with decomposing organic matter, and swarming with countless bacteria. The isolation of one particular species among so many is a task of extreme difficulty, and negative testimony is of little value. Even the most skilled observers abroad have failed to detect this particular organism under similar conditions, although it was known to be certainly present. In the investigations made for this department the organism which produces typhoid fever was not found in the water itself. My bi-monthly analyses of the water to determine the number of organisms were made on the first of December, but as only a few plate cultures were made the negative result obtained can have little value, yet as the epidemic was rapidly diminishing by the end of the first week in December, it is probable that there were no typhoid organisms in the water itself at the time the analyses were made. The typhoid organisms were, however, found in three of the filters. One of these filters came from the west side of the city, and the others from the east side, one from the northern and the other from the southern part. None were on the high service supply. Filter No. 1, a 'Star' filter, was removed from the tap December 8th. The patient was taken sick December 1st, and the filtered water had not been used for drinking purposes since that time. There was a trap in the sink-pipe of the sink where the faucet was. There was no water closet in the house, and the stools of the patient were disinfected and thrown into the vault.

"Filter No. 2, a 'Grant' filter, was removed December 6th. The patient was taken sick November 29th, and died of hæmorrhage December 17th. The plumbing of the house was complicated, but perfectly trapped and in good order. The water closet received patients' stools. The kitchen sink, over which the filter was placed, had a separate waste-pipe which was trapped in the cellar. The clinical history of the case was typical.

"Filter No. 3, an 'Aborn' filter, was removed December 6th. The patient was taken sick December 1st. The plumbing was in first-class condition, and the sanitary conditions of the house, one of the finest in the city—perfect. The filter was over the pantry sink. Patient's disease ran a typical course so far as fever and other constitutional symptoms were concerned, but there was a tendency to constipation all through the disease. The stools were examined once for the typhoid bacilli, but none were found. The stools were not examined in the two other cases.

"There is no question that the patients who used these filters were suffering from true typhoid, and there was no chance for these filters, either while in position, or after they were removed, to become contaminated except from the water which passed through them. Besides the typhoid bacilli, several organisms characteristic of *faecal* matter were found in the filters indicating the source of the specific contamination. In fact one of the filters, so far as the organic life was concerned, resembled, as Prudden said, a mixture of charcoal, water and human *faeces*.

"These investigations demonstrated the presence of the typhoid bacillus in our public water supply, and also the dangerous character of the domestic filters in common use, and they also prove that the short epidemic of November and December last was due to the pollution of the Pawtuxet River by the stools of typhoid fever patients."

QUACKS AND THEIR "HARMLESSNESS."

"Well, if they do no good, they certainly do no harm;" such is the statement one often hears from the lips of those who consult the quack doctor, a slight emphasis being placed on the word "they," leaving it to be inferred that if the regular physician fails to do good *he* must of necessity do harm. We were consulted recently by an educated lady for an illness in which frequent and abundant urination, excessive dryness of the mouth and pruritus *vulvæ* were prominent symptoms. She told us that she had consulted a well-known quack, who had gone into a trance, and while in that condition had given utterance to some figures, which by the way she had previously been told by him she must remember. These figures indicated the particular remedies which were adapted to her case. She mentioned to him the annoying pruritus, and he told her that he had always found slippery elm good in those cases. In mentioning these incidents to the writer, she said she was far from well, but she must give him credit

for having improved the pruritus. Physicians will not be surprised to be informed that the specific gravity of the urine was, upon examination, found to be 1045 and that sugar was present in large quantities. Had a regular physician failed to make the necessary examination of the urine in such a case, he would at once have been denounced, and probably been called upon to defend himself in court. But for the quack there is no denunciation, rather a commendation for any improvement in the symptoms, however slight, even though the grave nature of the malady remains undiscovered and its proper treatment utterly neglected.

OBITUARY.

FRANK W. ROCKWELL, M. D.

At the last meeting of the Hospital Faculty of St. Mary's General Hospital, the following resolution was passed :

The Hospital Faculty of St. Mary's Hospital desire to put on record their deep emotion at the death of their friend and colleague, Dr. Frank W. Rockwell. Dr. Rockwell died at the age of forty-six, on the very threshold of what is regarded as the intellectual prime by all civilized races. Yet he stood in the foremost rank of his profession, not only in the city of his residence, but throughout the country. That fact alone attests his intellectual stature. But those who knew him more intimately than by reputation knew that his character was a rare combination of the mental qualities which compel praise and the softer ones that win without the asking. Endowed with a marvellous capacity for absorbing information, so that he was at home in every branch of his profession; with a delicacy of touch and mechanical skill as an operator that met the requirements of the best surgical *technique*; with abounding and quick resources, and excellent judgment, he had as well a gentle nature and a gentle manner, an omnivorous appreciation of humor and art and literature, and the changing phases of nature. What better credentials than these can a man have to the esteem of his friends during life, and to their remembrance after death? Physicians though we are, accustomed to death and disease, and their ravages and surprises at every turn, a death like this comes home to our bosoms, and we can only inadequately express to the widow of Dr. Rockwell our sorrow, and the infinite sympathy we feel for her and her children.

WILLIAM E. GRIFFITHS, M. D. }
 LONDON CARTER GRAY, M. D., } *Committee.*

IN MEMORIAM.

Report of Obituary Committee of the Brooklyn Surgical Society, read and adopted at the meeting of June 6th, 1889.

For the second time in the history of the Brooklyn Surgical Society its members have been called upon to mourn the loss by death of one of its founders. Scarcely had the first year of its existence passed when the grim Conqueror invaded our little circle; and now, in a little more than a year and a half from the day of its organization, Dr. Frank W. Rockwell, its first president, chief counsellor and ever steadfast and faithful supporter, has been called upon to lay down the burden of life,—to forego the joys of earthly existence.

It is difficult to estimate the loss, so great is its magnitude, which this society, the profession at large, the city of his adoption and the field of his labors, and humanity in general have sustained, in the death of such a man. The very name of Rockwell brings up a flood of memories of a life bristling with brilliant deeds, faithful labor and good work well done. At no time blessed with a robust physique, who ever knew him to plead weariness or to seek rest when a professional brother needed the exercise of that rare skill and judgment which he possessed in so eminent a degree, in behalf of some suffering one, poor and lowly though the patient be? Who among us cannot now recall the warm pressure of the friendly hand clasp that spoke sincerity and loyalty in its very touch; or the bright smile, carrying encouragement and sunny cheer at every glance; or the voice, the tones of which spoke volumes in every sentence, of earnestness and truth?

His position in the profession was essentially and instinctively that of a leader. Yet, those who have seen him at the bedside, in the consultation room, or by the operating table will recall that innate spirit of modesty which characterized him ever. In discussions before this society, although he always held pronounced views upon current surgical questions, and ever boldly and fearlessly stood for what, in his judgment, was true and rational, yet, so courteous and free from aggressiveness was his language, and so palpably pure his motive, that an opponent might well rest as comfortably under his friendly criticism as within the circle of commendation of the most ardent supporter.

On the very threshold of his professional life Dr. Rockwell seems to have been animated by an indomitable courage and desire to succeed in the calling of his choice. He seems to have kept before him the memorable words of Richelieu, with all their ringing force and deep significance, and in his lexicon there was "no such word as fail." He was constantly looking forward to new and better mea

and measures for the advancement of his profession and for the interests of those of suffering mankind who entrusted themselves to his care. In his desire to maintain a position at least fully abreast of the time, and to forget, in the advancing progress of to-morrow the well enough of to-day, he fully exemplified in his daily life the old German adage, "Das Bessere ist ein Feind des Guten."

As a result of all this untiring zeal, unflinching courage, constant application and earnest, well-directed effort, combined with all the other qualities which go to make up the man marked for preferment by his brethren and the public at large, what wonder is it that he steadily but surely made his way into the confidence and esteem of all with whom he was ever brought into contact? At the very acme of his lifework, when the rewards and blessings which follow in the train of such commendable endeavors as marked his pathway almost from the very moment when he passed from beneath the protecting shadow of his beloved alma mater, he is called from his labors, almost before the opportunity of enjoying the fruits thereof has been his, save only the joys which arise from the knowledge of having lessened the sorrows of affliction and the pangs of despair. These were ever his, for no chiding word or impatient gesture marked his intercourse with his patients, be the latter the occupant of the humble hospital cot or among the more fortunate ones of life.

This is what was written of him four years before his death, and only recently given to the world and to his sorrowing family. It is a fitting tribute to pay at any time, and under any circumstances, to such a life.

"Sometime I would have scorned the cup he brings,
Revolting from the draught ; but when he flings
The challenge of his smile across the rim,
With answering smile I turn and drink to him.
Bitter or sweet, I dare it to the lees :
It is my own ; I take it, pain or peace,
Unfaltering, and glad, with gratitude to him,
Whose friendly smile has crossed it, rim to rim."

GEORGE R. FOWLER, }
EDWIN A. LEWIS, } *Committee.*

PROCEEDINGS OF SOCIETIES.

KINGS COUNTY PHARMACEUTICAL SOCIETY.

The regular meeting of this society was held Tuesday, June 11th, at their rooms. President Davis in the chair.

There were reports from Finance Committee and from Board of Trustees.

Society appropriated \$50 to the sufferers by the Johnstown disaster.

An amendment to the by-laws was passed, changing the name of Committee on Unofficinal Formulæ to Committee on Revision of Pharmacopœia and Unofficinal Formulæ.

Committee on Legislation was appointed, namely: W. P. De Forest, Chairman; C. R. Paddock, L. F. Stevens, Robert Black, L. E. Nicot.

Committee on College of Pharmacy reported the outlook favorable.

Delegates were appointed to the American Pharmaceutical Association, as follows: J. H. Benjamin, C. R. Avery, C. W. Kitchen, W. P. De Forest, L. T. Perkins.

Dr. Sheets read a paper upon "Cottonseed Product."

Dr. Eccles gave an interesting account of the State meeting.

Drs. Sheets and Eccles received the thanks of the Secretary.

Adjourned until September.

Respectfully,

F. W. BLISS, *Secretary*.

NEW YORK STATE MEDICAL ASSOCIATION.

The Fifth District Branch of the New York State Medical Association met in Brooklyn, May 28th, morning and afternoon. Dr. W. T. Lusk read the opening paper, being the presidential address, in which he recounted two cases of Cæsarian section not hitherto published. Five other contributions, among which were a surgical one by Dr. J. A. Wyeth of New York, one by Dr. T. H. Allen, and one by Dr. F. E. Martindale of Staten Island, which with the discussions thereon fully occupied the day.

The Executive Committee reported the success of the "Permanent Fund" plan, which obviates the payment of small annual dues by the advance payment of an amount sufficient for the purchase of a bond or bonds, the interest whereon will meet the expenses. This rather novel expedient among medical fraternities seems to be admirably adapted to organizations which, like the Fifth Branch, meets infrequently and embraces a wide territory. The perpetuity of such bodies is not a little embarrassed by the difficulty of getting small dues into the treasury. The officers of the Branch for the current year are: President, Dr. W. T. Lusk; Executive Council for Long Island, Drs. William McCollom, Edwin Webb, and W. D. Woodend; and Secretary, Dr. E. H. Squibb. The next meeting will be held August 27th, at Port Jervis, Joseph Halsey Hunt, M.D., Chairman of Arrangements Committee; concessions on the part of railway officials have been promised for the delegates, and will be made public later.

NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.

At the Spring meeting of the Board of Directors of the New York Post-Graduate Medical School and Hospital, the following additions were made to the Faculty:

J. H. Ripley, M.D., Professor of Diseases of Children; R. W. Taylor, M.D., Professor of Diseases of the Skin; J. B. Emerson, M.D., Professor of Diseases of the Eye and Ear; Frederic Bagoe, Ph.B., Professor of Pharmacology.

NEW YORK POLYCLINIC.

Dr. H. C. Coe has been elected to the professorship made vacant by the death of Professor James B. Hunter.

CORRESPONDENCE.

SPECIALISTS AND SPECIALTIES.

To the Editor of the BROOKLYN MEDICAL JOURNAL :

In the April number of the JOURNAL appears an article entitled "Specialists and the General Practitioner." The author speaks of the difficulties that lie in the way of the young doctor earning a livelihood, and thinks it is due, in the first place, to a healthful competition and to other factors, which he says account for a great deal of the uncalled-for struggling experienced by young physicians. These factors are, first : The inefficient acquirements, both theoretical and practical, of those starting in the practice of medicine. How this deficient knowledge affects the young doctor, according to our author, is as follows : Not knowing how to deal with the first cases that come to him, he sends for a specialist in the departments in which they occur. Such an action may be bad for the y. p., but it is certainly an excellent thing for the patient ; and perhaps when the gamut of the ordinary cases met with in general practice is run, and the treatment instituted by the specialist carefully observed, the y. p. may be prepared to stand on his bottom. He certainly should be obliged to his instructor, who has taken on his shoulders the duty of teaching perhaps that which should be required by a medical school that conscientiously examined and disposed of its applicants for the degree of M.D. But our author has assumed that the young doctor is better versed in the theory and practice of morality than in medicine. We fear that many would yield to the temptation of treating what they do not understand rather than trust to the mercies of one who has special knowledge of the subject, and who might steal the patient. Is this not the gist of the matter, Doctor? We scarcely believe that ignorance would lead the practitioner to send to the specialist. On the contrary, we do believe that the best posted general practitioners are the specialist's best friends.

The second factor to account for the unfortunate position of the young doctors is, as the author states, "Too many specialists and too many specialties." In regard to what should constitute a specialist, the doctor says : "He should be a man of mature mind, consequently one who has reached the middle life at least, and one who has had an extensive experience in general practice in all its phases ; . . . one who in the course of many years of general experience has found himself intuitively drifting towards a special line of study for which he has

instinctively developed a particular liking." The idea to be gathered from these remarks is that the specialist should be developed from the general practitioner—the gentleman who has practiced for some time and has many years of general experience. This is to-day impossible; and if the special departments continue to make such strides in the next few years as they have in the past, the truth of the remark cannot help but be generally appreciated.

It is the rule in the development of a department of science that the first successful workers must be men of decided force of character and originality of mind. As the department acquires knowledge and the workers greatly increase in number, the requirements change somewhat. Broad principles have been formulated, and the effective worker must know what others are doing. He must be familiar with the literature of the subject and the technique of his specialty. When a department has so much special knowledge as that pertaining to ophthalmology, gynecology, neurology, or dermatology, it is impossible for the general practitioner, who is but a general specialist, if I may be allowed to use the term, to keep up with the times.

When a man has reached maturity, the middle period of life, it is too late for him to commence the study of a specialty which should require two or three years of exclusive study to fit himself, unless he is willing to confine his efforts to this work, and very few would be willing to do this. The fact that we have in Brooklyn gentlemen who have acquired world-wide reputations in special branches, and who commenced their medical life as general practitioners, is no proof of the incorrectness of these remarks. They overcome enormous obstacles and, to a man, sigh when they think of the vast amount of unnecessary work they had to accomplish. The majority of them may fairly be entitled to be called pioneers.

Ophthalmology has earned for itself the undisputed right to demand from its followers special study and preparation, and one who attempts its operations without this preparation may find himself restricted by the arm of the law, and the day is not far distant when this will be equally true of the other specialties. In fact the general practitioner is a general specialist who treats the heart, lung, kidney, and intestinal diseases, who must be something of a gynecologist, obstetrician, dermatologist, neurologist, etc. The man who boasts of doing an operation without having seen one of its kind before, if he lives within limits that permit of his doing so, deserves censure, no matter how skilfully he accomplishes his purpose.

In regard to the anecdotes of the mistakes of specialists, permit me to call the doctor's attention to the fact that, with the exception of "those men who never make mistakes," there is none of us who has

not at times been placed in a position that he could justly be ridiculed. Let us, however, take care that this position may not arrive from our disregarding the great benefits that accrue to the profession from so many divisions of the science of medicine, as may give their votaries their life work. It is too late to block the advance of special work by ridicule. Public opinion has become educated, and no amount of professional bigotry can bar the progress of one of the greatest advances in the recent history of medicine, the division of work. We have not too many specialists or specialties, but we have too few properly educated specialists.

A. H. BUCKMASTER,
207 Clinton Street.

MISCELLANEOUS.

DEPARTMENT OF THE INTERIOR, CENSUS OFFICE,

WASHINGTON, D. C., May 1, 1889.

To the Medical Profession:

The various medical associations and the medical profession will be glad to learn that Dr. John S. Billings, Surgeon U. S. Army, has consented to take charge of the Report on the Mortality and Vital Statistics of the United States as returned by the Eleventh Census.

As the United States has no system of registration of vital statistics, such as is relied upon by other civilized nations for the purpose of ascertaining the actual movement of population, our census affords the only opportunity of obtaining near an approximate estimate of the birth and death rates of much the larger part of the country, which is entirely unprovided with any satisfactory system of State and municipal registration.

In view of this, the Census Office, during the month of May, this year, will issue to the medical profession throughout the country "Physician's Registers" for the purpose of obtaining more accurate returns of deaths than it is possible for the enumerators to make. It is earnestly hoped that physicians in every part of the country will co-operate with the Census Office in this important work. The record should be kept from June 1, 1889, to May 31, 1890. Nearly 26,000 of these registration books were filled up and returned to the office in 1880, and nearly all of them used for statistical purposes. It is hoped that double this number will be obtained for the Eleventh Census.

Physicians not receiving Registers can obtain them by sending their names and addresses to the Census Office, and, with the Register, an official envelope which requires no stamp will be provided for their return to Washington.

If all medical and surgical practitioners throughout the country will lend their aid, the mortality and vital statistics of the Eleventh Census will be more comprehensive and complete than they have ever been. Every physician should take a personal pride in having this report as full and accurate as it is possible to make it.

It is hereby promised that all information obtained through this source shall be held strictly confidential.

ROBERT P. PORTER,
Superintendent of Census.

A TOKEN OF MERIT FOR BIOLOGICAL RESEARCH.

The following extract from a letter of Dr. Daniel Ayres to the Board of Directors of the Hoagland Laboratory sufficiently explains itself.

BROOKLYN, April 5, 1889.

"The term '*Laboratory*,' although illumined by the name of its worthy projector and patron, still like many other so-called '*phenomena*,' imperfectly discloses the scope of the project, the social position it may legitimately fill, or the beneficent purposes it has yet to develop.

"For a time it will only be the relatively *few* who can see, and the *fewer* who will be able to understand and thoroughly appreciate, all that is embraced in this word '*Laboratory*.' As you all know, its *root* lies in the grand word '*Labor*;' or *mental and muscular work*, in its *highest, deepest, broadest* and *best sense*, designating a far grander '*scope*' than the terms '*school*,' '*college*,' or '*university*' *now do*. I dare not here venture to dwell upon or amplify the train of thought that circles around this sublime aspect of the theme, for it would carry me far beyond the specific object now in view.

"Whatever may be the scientific attainments of any individual, the value he places upon them, or the intense gratification which is the immediate reward of all thorough and absorbing work, the public recognition of the actual merits of that work, by those best fitted to appreciate and judge its value, will not be among the least of the many factors that go to constitute '*personal satisfaction*.' However gifted

and industrious, however seemingly isolated, and at times indifferent, some may 'appear,' I think it would be difficult to find a sane individual totally devoid of some respect for the 'opinions' of his fellow beings.

"Such a 'sense' may, and often does, find an abnormal development, but none the less is it a sanatory, natural sentiment, and among the strongest bonds of social unity.

"As a beneficent stimulant to the recipient to do more and better work, and as a reflex impetus to others, I cannot imagine that some form of hearty public recognition, judiciously bestowed, can have any other than beneficent results; and with this conviction I hopefully look forward to the time when such an official recognition from the Hoagland Laboratory will be honorably coveted as a highly prized acquisition.

"The term 'biological research' covers an immense field of inquiry, which seeks for the conditions (both 'natural' and 'artificial') under which the phenomena of both normal and abnormal life may be evolved and maintained within the absolutely fixed limits of duration, or existence, upon this earth.

"Any line of investigation, therefore, which tends to define and elucidate *these conditions* (which are the highest aspect of natural law and order) will be included in *this term*; and it is for the *promotion* of this line of inquiry that I propose (with your approval) to institute one permanent form in which the approbation of the Hoagland Laboratory may be publicly expressed; thus benefiting *itself* while cheering and blessing *others*.

"As a contribution to this purpose, I have placed in the hands of your treasurer securities which will yield an annual interest of thirty-five dollars.

"I respectfully suggest that the first expenditure, upon the necessary 'dies,' etc., should be amply sufficient to make it a creditable work of art.

"You will observe that I do not 'name it' 'a medal,' nor 'a prize,' but *a token of merit awarded by the Hoagland Laboratory*.

"I do not propose to limit this award to the students of the L. I. C. H., at the time of graduation, although freely open for their competition *when found worthy*, and would prefer to see it made the reward of *post-graduate* work, and open to all competitors who have pursued biological inquiries in connection with the Hoagland Laboratory, thus giving to it *a higher standard* than the preliminary collegiate studies are usually entitled to, and which I understand are amply and already provided for by '*medals and prizes*.'

"I would further suggest that *each award* of this token be adjudged by a committee appointed by the Board of Trustees, and subject to final approval by the latter.

"At what periods of *time*, and on what *occasions* each award had best be made, is left to the discretion of the trustees."

THE CONTROL AND CARE OF PAUPER INEBRIATES OF TOWNS AND CITIES.

In an article on the above subject which appeared in the *Journal of Inebriety*, Dr. L. D. Mason, the author, after discussing the reformatory, the workhouse, and the hospital, where he would place the chronic inebriate without friends and without means, says:

"But while the above institution will care for the chronic inebriate, it does not, and cannot, fill a want severely felt and long needed—how shall we deal with intoxicated persons arrested on the streets by the police?

"The usual method is to arrest them, take them to the nearest police station, prefer a charge of intoxication,¹ with or without disorderly conduct, record the case on the blotter, and commit the accused to a cell to await the sentence of the justice. The following morning he is brought before the police court; if a first offence, and not particularly aggravating, sentence may be suspended; usually a fine is inflicted, and if this cannot be paid, ten days in jail is the penalty. If the prisoner is an 'old offender' and 'incorrigible,' who has appeared before the justice probably several times, he or she is sent to the 'penitentiary' or the 'Island' for a period not exceeding six months. To this method of dealing with intoxicated persons arrested on the street or other public place there are several objections; in the first place, the average policeman is not a good diagnostician. Every case where the person is found stupid, dazed, or unconscious, is to him a 'drunk,' and must be 'run in.' Hence, persons suffering from stupor, partial or complete, arising from certain cerebral conditions resultant from head injury, uræmic disease, or narcotics of any kind, unless these conditions are accompanied by marked evidence of assault, or other severe injuries, are apt to be mistaken for alcoholic intoxication. This is not the fault of the police—they are not diagnosticians, neither, indeed, can be; these cases oftentimes puzzle the most experienced

¹ In cases where the higher degrees of crime, as murder, grand larceny, assault, are associated with intoxication, the crime of course takes precedence. We are now considering cases of simple intoxication.

physician. The system that allows such a state of affairs to exist is at fault, not the policeman who fails to make a proper diagnosis.

“Certainly, to place such cases in a cell, and allow hours to elapse before the true condition of affairs is apprehended, is a grave and serious error.

“But even if the stupor is alcoholic, and the arrest therefore legitimate, we maintain that the cell is an unfit place for such a person seriously intoxicated.

“Richardson, in his ‘Cantor Lectures,’ thus writes: ‘Whenever we see a person disposed to meet the effects of cold by strong drink it is our duty to check that effort, and whenever we see an unfortunate person under the influence of alcohol it is our duty to suggest warmth as the best means for his recovery.

“‘These facts prompt many other useful ideas of detail in our common life. If, for instance, our police were taught the simple art of taking the animal temperature of persons they have removed from the streets in a state of insensibility, the results would be most beneficial. The operation is one that hundreds of nurses now carry out daily; and applied to our police-officers at their stations, it would enable them not only to suspect the difference between a man in an apoplectic fit and a man intoxicated, but would suggest naturally the instant abolition of the practice of thrusting the really intoxicated into a *cold* and *damp* cell, which to such a one is actually an ante-room to the grave.’

“In view of this, in the ‘London Metropolitan district’ the cells in which intoxicated persons are received are properly warmed in cool weather.

“In addition to this, we maintain that every case of alcoholic coma or stupor should come under medical supervision, that the police surgeon should make the diagnosis—not the policeman who made the arrest—and appoint the proper remedial agents. Too often the cell door has been shut and the prisoner allowed to ‘sleep off’ his intoxication, and ‘the sleep that knows no waking’ has come to him before morning.

It has been suggested that in every large city there be established a central hospital, convenient of access, where all seriously intoxicated persons, or persons found dazed or stupid upon the streets from other causes, can be taken and receive prompt medical aid, and from thence, after they are sufficiently recovered, sent to their own homes, or if friendless and homeless, assigned to the insane asylum, the inebriate asylum, the charity hospital, or such institution as seems to be most appropriate for their condition.

There is still another class, not directly coming under police supervision, to whom such central reception hospital would be a great boon

—those who through alcoholic excesses develop delirium tremens or acute alcoholic delirium, those living in boarding-houses whose means are limited, who cannot command nursing and medical attention. The regular city hospitals refuse such cases, except special arrangements are made and high rates are charged; then only cases of acute alcoholism are taken; of course chronic alcoholics are peremptorily refused. There is good reason for this; general hospitals have no special provision for cases of contagious disease, insane persons, or cases of alcoholism; no padded rooms, no extra attendance, none of the appointments necessary for the care of such cases.

“The suburban inebriate hospital outside of the city is already tested to its full capacity with chronic cases of inebriety. It is at some distance from the city, and to enter a patient in its wards requires certain legal formalities, and therefore time.

“Such a central hospital in the city, accessible at all times, especially to this class of cases under consideration, for which no provision is made at the general hospitals, would provide at least temporary care and treatment for insane or intoxicated persons found upon the street. It would be a channel through which the inebriate asylum, the insane asylum, or the general hospital, would receive its proper class and quota of patients. It would, as a ‘bureau of distribution,’ save much trouble now experienced in assigning insane persons to inebriate asylums, and alcoholic to insane asylums, as well as persons to either of these who might need the care of a general hospital.

“While not directly established for this work, it would indirectly do considerable of it.

“Besides this, the establishment of such a special hospital mainly for the treatment of such cases, would afford excellent opportunities to study alcoholism in its more acute forms. The capacity of such a hospital need not exceed fifty beds, as from it would be constantly sent out all cases not appropriate to it, and all cases assuming a chronic character.

“It would not be altogether dependent upon the city for its support, as the friends of many would gladly pay for the privilege of having cases treated in its wards rather than in their own homes. Acute cases of alcoholism, after recovery from the immediate attack, should their cases warrant it, could be assigned or committed to the inebriate asylum for ‘*chronic inebriates*.’

“Fortunately, we are not without precedent in this matter. The establishment of a special city hospital devoted to the care of ‘acute cases of alcoholic delirium,’ to which the police are directed at all times to bring persons found upon the streets seriously intoxicated or stupid from other cause, and all others who may desire to have their

friends treated for acute alcoholism. 'The Bureau d'Admission,' of the department of the Seine, at St. Anne Asylum in Paris, of which Dr. Magnan is one of the two physicians, is an institution to which no exact parallel exists in England or in this country. To it are brought all the cases of insanity previous to their admission to the various public asylums, and all cases of acute delirium or mania which fall under the care of the police in Paris. It is here that they are examined, and their admission or rejection decided upon. If admitted, they are drafted to the one or other of the asylums which is most suited to the class of the patient or the form of his malady.

"The Bureau d'Admission is quite distinct from the St. Anne Asylum itself, and under altogether different administration. In order to provide accommodation for the temporary lodgment of patients on their way to other asylums, and also for the reception of the more acute cases, it is provided with about fifty beds, and is fitted up in every way as a small asylum. Here there are brought all the cases of delirium tremens and 'simple alcoholic delirium' which fall under the notice of the police, and a large number from the lower and middle classes, and here they are treated until their recovery. Hence, it it comes to pass that a very large proportion of all the cases of delirium tremens occurring in Paris and its vicinity come under observation here, and this not only in one attack, but again and again, and when at last by repeated attacks they have become mentally deranged or greatly weakened, they again come under notice for transference to asylums.

"The results of such opportunities of observation, could scarcely fail to be productive of an increase of our knowledge, and their value is necessarily augmented by the fact of their being utilized by experienced alienists, and seen side by side with other forms of acute delirium. In addition to the hospital wards there is an out-door department, where discharged patients and others return for treatment of the various nervous disorders induced by their habits.

"This hospital does excellent work, but there should be a large suburban hospital for the control of the more chronic forms of inebriety, and persons treated for an acute attack 'should not be allowed to return again and again, until their minds were weakened and they became thus fit subjects for the insane asylum.'

"Such asylums, for long periods of commitment of chronic inebriates, exist in America, in England, in Australia, in New Zealand, and in Germany.

"Much interest is now manifested by the public and the legislatures of States on this all-important topic. It is necessary, therefore, that legislative effort be directed in the proper channels, and the

inebriate, who constitutes so large a proportion of our population, should be laid hold of and dealt with systematically and scientifically, not as criminals but as those deprived of their reason and their volition—those automatic in their actions, vicious in their propensities, a curse to the community in which they dwell. Restrain, control this class, and you reduce prodigality, want, disease, to a minimum, and produce the best sort of political economy based on science and common sense. Allow this class their liberty, and you foster these evils, and encourage and propagate their results.

“Imprisonment, punishment—all punitive laws—have failed to abate or even mitigate the evil. Any effort directly based on fear of punishment or moral suasion will fail. We must place the evil on its true basis—that of DISEASE—and treat it accordingly. Yellow fever, cholera, small-pox we quarantine. We investigate the causes of epidemics, and we endeavor to remove that cause; so with alcohol and its attendant evils. Punitive and restrictive laws should be directed against the manufacture and sale of alcohol, not against its victim, the inebriate. How we shall care for the homeless, friendless, pauper inebriate, as he is presented to us in the acute and chronic forms of his malady, it has been the province of this paper to point out.”

SPECIAL MEETING OF THE FIFTH DISTRICT BRANCH OF THE N. Y. STATE MEDICAL ASSOCIATION.

The seventh Special Meeting of the Fifth District Branch of the N. Y. State Medical Association will be held in Port Jervis (Orange Co.), N. Y., on *Tuesday, August 27, 1889*. For those who are willing to spare the time after the meeting, a beautiful and interesting carriage drive of seven miles along the Delaware River to Milford, Penn., is promised. All are urged to make an effort to attend this meeting, as the following Committee of Arrangements are making every preparation to insure an interesting meeting, both scientifically and socially: Dr. J. H. Hunt, of Orange Co., Chairman. Drs. W. B. Eager and M. C. Conner, of Orange Co. Drs. T. W. Bennett, W. H. DeKay and J. A. Munson, of Sullivan Co.

W. T. Lusk, *President*.

E. H. SQUIBB, M.D., *Secretary*,
P. O. Box 94, Brooklyn.

THE BROOKLYN MEDICAL JOURNAL.

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 9.

BROOKLYN, N. Y., SEPTEMBER, 1889.

WHOLE NO. 21.

ORIGINAL ARTICLES.

A NEW ETHER INHALER, WITH SOME REMARKS ON THE USE OF SULPHURIC ETHER AS AN ANÆSTHETIC, WITH ILLUSTRATION.

BY J. H. HOBART BURGF, M.D.,

Surgeon to L. I. College Hospital; Consulting Surgeon to St. John's Hospital, Brooklyn, N. Y.

Read before the Medical Society of the County of Kings, May 21, 1889.

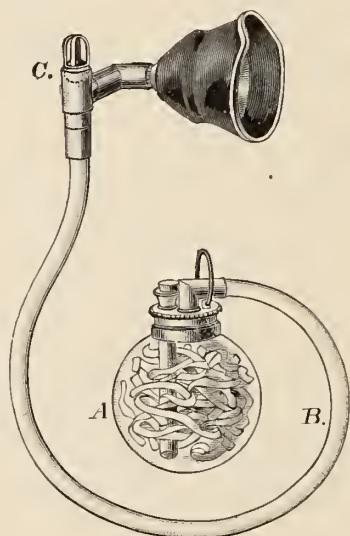
Skill, judgment, knowledge and personal responsibility are involved in every case where an anæsthetic is administered. This will hold true whatever apparatus be used, and no surgeon will trust to the "Inhaler," but to the *eye* and *ear* and *finger* and *brain* of the *administrator*.

Entering the profession just at the time when the value of ether inhalations was first demonstrated, and having had abundant opportunity in forty years of city practice to observe the good, the bad, and the indifferent in all the methods adopted by medical men in the production of anæsthesia, the writer does not esteem it presumption to have some decided opinions upon the subject.

I have no desire to enter upon a full discussion of these opinions at this time, and, in order that what I shall say may be as concise and as practical as possible, I will make the different parts of the apparatus which I have the pleasure of showing, each in its turn a text or pretext for some brief observations.

As a whole, this "Inhaler" is not the result of a single effort or experiment, but of a long series of trials extending over several years, the object being to reject everything which did not thoroughly answer the purpose for which it was constructed.

No formal description of this device is necessary. One view, either of the "Inhaler" or of the printed illustration, will suffice for a full understanding of all its parts. In this age of thoughtfulness as to the necessity for extreme caution lest we should transfer the germs of disease from one patient to another, it will be observed with interest that there is nothing in the "Inhaler" to become contaminated by the exhalations or expectorations of the patient—the mouthpiece and valvular portion being so constructed that they can be taken apart, cleansed and reconnected in a moment. It may therefore be appropriately called an aseptic inhaler.



The ether being vaporized in a glass globe, very little escapes into the atmosphere of the operating-room—none is wasted, and the surgeons and their assistants escape much annoyance. The transparency of the globe enables the surgeon to see at a glance when the supply of ether is about to be exhausted and needs to be replenished; this will be fully appreciated by those who have found themselves tired of guessing whether the supply in a closed receptacle was too little or too much.

Desiring to increase the evaporating surface, I have placed in the globe some strips of ordinary writing paper, which by experiment I found was not in the least changed by soaking in ether; the moment

the ether has volatilized, the paper is as crisp and dry as before it was used.

The atmosphere passing into the globe synchronously with the inhalations of the patient, strikes upon or passes through the ether and is a constant and exact index of the character of the patient's respiration as to regularity, frequency and fulness. Special attention is invited to this fact.

No greater difficulty has been experienced in the construction of inhaling apparatus than in the choice of valves which would not adhere, or otherwise fail to open or close at the right instant.

The thorough automatic and pneumatic action of the metal ball valves prevents the commingling of the products of respiration with the ether vapor inhaled, and the click of these valves is an additional evidence that both air and ether vapor are being inhaled in due proportion, and that the waste products of respiration are being duly thrown off. On the other hand, if the click of the valves is not heard, it is a sure indication that the patient is getting neither air nor vapor through the inhaler, and that it is the instant duty of the administrator to ascertain the reason; it may be only because through inadvertence the mouth-piece is not in apposition to the face, or it may be that the patient is not breathing at all. It follows from these premises that the amount of atmospheric air inhaled is sure to be as nearly as possible proportioned to the amount of vapor inhaled, since the more rapid the breathing the more rapid the evaporation, and the slower the breathing the slower the evaporation. If the patient gets the ether vapor he must get the air also at every inspiration.

The element of suffocation being entirely eliminated, the so-called stage of muscular excitement or rigor is exceedingly rare, and proper care being observed as to the previous taking of food, vomiting seldom occurs.

By an entirely new and unique device, the rubber mouth-piece is so formed as to obviate the necessity, so much felt in the past, of using a thin and destructible material and inflating it to make it fit; in this case the edges are so formed as by their own elasticity to shape themselves to the face.

The globe in which the ether is vaporized is separated from the valvular portion of the apparatus by three feet of rubber tubing, so that the globe may be suspended by a nail or around the neck of the surgeon. I have not been able to satisfy myself that there is any advantage in conducting the vapor from a distance before it reaches the lungs of the patient, except that it is more convenient, and especially so in the case of an obstreperous subject.

Some writers have supposed that great danger was to be appre-

hended from subjecting the lungs to the inhalation of intensely cold vapor, and have thought to lessen the risk by this method of conduction. I have not seen a word in response to what seems a great misapprehension. Every one knows that when ether vaporizes it freezes everything in the immediate neighborhood, but, simply because to assume the vaporous condition it demands caloric which it seizes from the nearest objects and bears it away with it to whatever region it travels. Fluid ether at rest has about the temperature of the surrounding atmosphere, and ether vapor the same temperature as the fluid from which it is generated. Now it generally happens that patients are anæsthetized in apartments varying in temperature from 60° to 90° F. It follows that no patient is called upon to inhale a vapor colder than the air he is accustomed to breathe. If, then, the ether be made to boil, which it will do before it reaches the normal temperature of the human blood (viz., at 96° Fah.), the vapor will continue at the same temperature so long as the ebullition continues unless it returns to its fluid condition by condensing upon a cooler surface. I am of the opinion that in the few instances in which pulmonary and bronchial inflammation have resulted from inhalation of ether, that the fluid itself has found its way into the lungs. The only practical deduction which I make is this: the operating-room being cold or the patient unsusceptible, or the globe of glass becoming encrusted with ice by the condensation of moisture from the atmosphere, it may be well to apply warmth *carefully* by means of a dry towel. It is rarely necessary.

This inhaler is very durable in all its parts, even the glass, being spherical, is not likely to break if it should fall upon an ordinary floor.

The last question of interest is as to the length of time required for anæsthetizing a patient. Every one knows that this must vary in proportion to the susceptibility of the patient and to the rapidity and depth of the respirations. So far as these two factors go, this inhaler offers no exceptions to the rule.

All are familiar with the fact that alcohol habitues are not very susceptible to etherization. Dr. William Wallace lately told the writer that he once saw an attempt made with the ordinary cone to anæsthetize a man with ether, and after an hour and a quarter it was given up. A very large number of cases could easily be collected, including every grade of susceptibility from this to the extreme of less than one minute; this variety of susceptibility obtains whatever the anæsthetic.

The other elements entering into the question of time are:

1. The extent to which carbon dioxide and other products of respiration are caused to aid in the asphyxia, and

2. The extent to which one feels justified in forcing the process.

By these two combined the patient will be narcotized in the shortest possible period and generally at the cost of unnecessary cyanosis, bronchorrhœa, meningeal congestion, rigor and often vomiting, beside all the inconveniences attending greater restlessness in the later stages of the case.

Suppose it does save time to the surgeon, have we either a moral or a legal right to employ the crowding process? This question is asked in all seriousness.

A most pernicious practice is that of seizing one or both hands of the patient at an early stage of the process, thereby inducing the impression that he is about to be smothered. I am sure that I have again and again witnessed all the horrors that attend a death from suffocation, and in one instance where it was desirable to anæsthetize a man a second time after an interval of several days, he swore that he would kill the first person that attempted to give him the ether. Another sad mistake is to tell a patient, as some physicians habitually do, "now this will make you feel as if you were going to choke, but you won't." The very suggestion is disturbing, and the object of the administration should be to make the whole process agreeable, as it often is, and if it may not be absolutely so, let it be as nearly so as possible. To this end, the first step should be to gain the confidence of the patient; the second and every subsequent step should be to keep it.

I do not deny that in some cases a wild stage is reached in which it is necessary to control the patient by main force and to continue the anæsthetizing process, but in all such cases the period of conscious cerebration is entirely passed, and there is subsequently no recollection of what has transpired.

When a patient is anæsthetized by the careful use of this apparatus there is generally no difficulty in keeping him absolutely quiet, without those perturbations of deep narcosis on the one hand and of threatened return to consciousness on the other which are so familiar to us all.

No surgeon would willingly subject a patient even for a short period to the constant reinhalation of the poisonous products of respiration unless the means of preventing this evil were in a given case very difficult to obtain. In the past this has really been the general justification. Nearly all the instruments that were furnished with valves were either expensive or destructible or both, or attended with some other inconvenience which prevented their adoption.

As already implied, the desirable end is not to produce insensibility in the shortest space of time, but to do it safely, pleasantly,

efficiently, and so as to avoid all possible detractions from the perfectness of the Divine gift of anæsthesia.

The Inhaler is manufactured by George Tiemann & Co., New York.

DISCUSSION.

Dr. DICKINSON.—I have seen several cases anæsthetized by this ingenious apparatus, and, while some have done well, it occurs to me that the lack of success at times has been due to two causes :

First. The apparatus is somewhat complicated. The originator does well with his own device, but every new man may find difficulty.

Second. The evaporating surface is comparatively small. In this Allis of mine there is by measurement an evaporating area of both sides of nearly two square feet (270 square inches). This old pattern takes half an hour to lace with a new bandage. But instead of replacing the bandage when soiled, I am in the habit of boiling it and bleaching the linen with Javelle water. This new model Allis has a top rim which lifts off and admits a change of bandage in three to five minutes.

Dr. BURGE.—Very few members of the society have seen this inhaler in its perfected state. Dr. Dickinson saw it in the early stages of its development only. Since then the evaporating surface has been much enlarged by the introduction of paper.

Dr. RAYMOND.—There are two points about which Dr. Burge has given us but little information: the amount of ether used by his inhaler, and the length of time necessary to produce complete anæsthesia by its use. While the element of time is secondary to that of safety, still it is a matter of some importance to bring a patient under the anæsthetic as rapidly as possible consistent, of course, with safety, and that apparatus which accomplishes this in the quickest time will naturally be preferred. The amount of ether consumed is also a point of interest. That apparatus which accomplishes its object with the consumption of the least ether is the preferable one. It is unfortunate that the statistics on this subject are so meagre and unsatisfactory with reference to almost all the inhalers now in use. I have often wondered whether in the few statistics which have been put upon record a mistake has not been made in supposing that Squibb's quarter-pound can held but four fluid ounces of ether instead of six, as is actually the fact. I know that I labored under this misapprehension for some time, and it is not unnatural to suppose that others may have done the same.

Dr. BURGE.—As regards these points I have found the variation so great in different individuals, both as to the length of time and the

quantity of ether necessary, that no statement of the average would be instructive. The time ranges from two minutes to half an hour, and the quantity from less than one ounce to more than six. I have measured both time and quantity very many times. In these respects I cannot compare this inhaler with others, except to say that in this no ether is wasted.

In reply to Dr. Shoop, who asked if this inhaler could be used for chloroform, I would say that when used for chloroform every drop is utilized. I would not deem it safe to give chloroform from an inhaler unless the fluid were measured and introduced ten minims at a time. In careful hands I think this would be a convenient method.

PUBLIC HEALTH IN BROOKLYN IN 1859.

Copy of Petition to the Mayor, Common Council and Health Officer, Brooklyn.

80 JORALEMON STREET,
BROOKLYN, 23d Dec., 1859.

To the Honorable Samuel S. Powell, Mayor,

To Messrs. John Cashow, John McNamee, Charles Jenkins, Peter G. Taylor, Robert F. Furey, Charles Franks, John Stansbury, James Van Brunt, Thomas F. Green, J. Leonard Douglas, John A. Dayton, Patrick Hogan, Demas Strong, Joseph Smith, Daniel Maujer, Anthony Walter, Timothy Perry, Martin Kalbfleisch, and Frederick Scholes, Esqrs., *Aldermen*, and to Dr. Samuel Boyd, *Health Officer*.

Gentlemen :

At a meeting of the Kings County Medical Society on the 15th ult., A. N. Bell, M.D.; A. Otterson, M.D.; E. R. Squibb, M.D.; H. Teller, M.D.; and J. A. Brady, M.D., were appointed a Standing Committee on Public Health; and on the request of Dr. Boyd, Health Officer (a member of the said Society), that the Kings Co. Medical Society would furnish him such matter as might be deemed of public utility to incorporate with his forthcoming report, the said Committee on Public Health were directed to consider Dr. Boyd's request and to report upon the same at the next succeeding meeting, which occurred on Tuesday evening last, the 20th inst.

In answer to this, the Committee reported that "The comprehensive and striking results brought out by the various recent investigations as to the best means of promoting health and preserving life in

cities, as well as those derived from old sources of information, have been so well grouped together in the Report of the Third National Quarantine and Sanitary Association, that we know of no better means of disseminating the required information than by the circulation of that report, or at least such a portion of it as specially applies to the hygiene of cities. And as we have ascertained that the last three papers in that volume, viz.: The Report upon Sewerage, Water Supply and Offal; the Report on the Importance and Economy of Sanitary Measures for Cities; and the Report of a Draft of a Sanitary Code for Cities, are to be published in a separate volume for general distribution in New York, the Common Council of that city having made an appropriation for the purchase of 10,000 copies for that purpose, we earnestly recommend to the health officer and the corporate authorities of Brooklyn, that they take measures to secure a like munificent act for our citizens. And that inasmuch as, in our opinion, attention would be more surely gained thereby, we advise that the said papers be bound up with the Report of the Health Officer, and that the whole emanate as the Health Officer's Report and accompanying documents."

The above report was accepted, and "it was unanimously

"*Resolved*, That the Committee on Public Health be and are hereby authorized to confer with the corporate authorities for the purpose of carrying out its objects.

"(Signed) J. BALL, *Sec'y.*"

In accordance with the Resolution of the Society, I have procured and submit herewith the three reports above named, together with a catalogue of the Kings County Medical Society, your petitioners.

Permit me to add, gentlemen, in behalf of the committee and the members of the Society, by whose authority I act, that it is a common *error* to suppose that a great mortality is an unavoidable necessity to city population. If proper attention was paid to the sanitary condition of cities, the average duration of life would *increase* in like ratio with their population. There are many examples illustrative of this proposition, among which Geneva is the most prominent. Carefully compiled health registers have been kept in that city for nearly three hundred years, and they are regarded as preappointed evidences of civil rights. The registration includes the name of the disease which has caused death, entered by a district physician, who is charged by the State with the inspection of every one who dies within his district. A table is made up from certificates, setting forth the nature of the disease, specifications of the symptoms, and observations, required to be made by the private physician who may have had the care of the deceased.

In the year 1589, when the laws were reduced to certain and reliable observance, the population of Geneva was 13,000; and the probabilities of life were to every individual born, eight years, seven months and twenty-six days. In the seventeenth century the population had increased to 17,000, and the probabilities of life to thirteen years, three months and sixteen days. And so on continually. From 1814 to 1833, the population being from 24,158 to 27,117, the probabilities of life for every individual born had increased to forty-five years and twenty-nine days. And at the present time the probabilities of human life for every individual born in Geneva (the population being about 30,000), are nearly fifty years.

London affords, if possible, a still more striking example of improved health consequent on increased attention to sanitary matters, though extending over a shorter period of time. In the middle of the last century the annual mortality in London was about one in twenty of the inhabitants. Since that time the number of the inhabitants has more than doubled, and the annual mortality is only *one in forty-seven*,¹ while at no period has the improvement been so rapid as during the last fifteen years. The great improvement in the health of London—and it is no less marked in other cities of England, has been chiefly brought about by following the example of Geneva, under a strict sanitary police. The English law being, in fact, the same as that herein recommended for publication, so altered as to be adaptable to our own institutions. In the absence of any such code—our own being a heterogeneous collection, providing no qualified *personnel* and involving no responsibility—our probabilities of life are lessening rather than increasing. Living in the same atmosphere as New York, the statistics of that city *too nearly* indicate our own condition. Take the seven years from 1820 to 1826 inclusive, the annual mortality of the *whites* in New York was one in forty, or according to the imperfect statistics at my command, about the same as the present average of Brooklyn. Subject to the same *régime*, there can be no question, to any one who will take the pains to examine the premises, that Brooklyn is following the same downward track, the probabilities of life lessening in proportion to our increase of inhabitants. We believe the first remedy to avert these calamities consists in the dissemination of sanitary knowledge—such knowledge as that incorporated in the documents above named, after which it will be a comparatively easy matter to enact and carry out the necessary laws for the noblest purpose of our existence—the preservation of human life.

I have the honor to be respectfully,

Your obedient servant, A. N. BELL, M.D.,

Chairman of the Committee on Public Health of the Kings Co. Medical Society.

¹ Considerably less than Brooklyn, which city is far more favorably situated, while London is ten times as large.

DISCUSSION UPON THE SUBJECT OF FRACTURES INVOLVING JOINTS.

Brooklyn Surgical Society, May 16th.

Dr. WIGHT.—I will not occupy much time upon this subject, but will open it fairly and leave it for discussion.

In the first place we might allude to the cause of these fractures, as being largely produced by direct violence. That part of the subject I will not take up more than to allude to it. The structure of the bone here has some relation to the subject; but those points I will not specially go into, but will pass them over and for a moment look towards the question of diagnosis. A correct diagnosis of these cases is conceded to be difficult at times. It is difficult for several reasons: one of the leading signs of fracture, crepitus, cannot always be elicited; one reason is that the fragments are separated by a clot of blood sometimes. I have found this to be the case in some post-mortem examinations. The blood-clot on one side will rub on the blood-clot on the other side, and it will require considerable force to bring the sides together so that the crepitus will be elicited.

Another reason of the difficulty is that it is not easy to distinguish between the motion of the joint itself and the new point of motion betwixt the two fragments.

Another reason is that the fragment may partly hold on; it may not be a complete fracture. That, in and of itself, is a subject of importance, and might occupy a good deal of time. When the fragment is not fully separated, of course the mobility is diminished or perhaps absent, so that crepitus cannot be obtained, nor can we be sure of a new point of motion.

One means of diagnosis that I have brought out pretty fully in published papers and in my lectures, consists of a careful measurement of the diameters of the part. For instance, if the elbow is broken into, the callipers applied to both elbows will show a difference in diameter. The same is true of the knee-joint; the same is true of the wrist and of the ankle-joint. This is an admirable means of diagnosis when the fracture is incomplete. The hip-joint does not present that peculiarity. There are special methods of diagnosis that I will not go into now that are important in making a diagnosis of fracture of the hip-joint.

So much in a very brief way in regard to diagnosis. And that of course leads me more directly to questions of treatment. And I would allude first to the extreme difficulty of making a reduction of the frag-

ments. That is perhaps one of the leading difficulties in the treatment of these cases, that is, of reducing the fragments to place. I have seen cases of incomplete fracture where the fragments were as immobile as a bone without a fracture. And even allowing that you can reduce the fragments to position, which I doubt in the majority of cases, it is extremely difficult by any known apparatus to keep them there. One reason why the fragments cannot be kept in place is that there is required more or less pressure upon the part, and my experience goes to show that pressure about an injured joint of any severity will cause ulceration, and the fragments will point through. Then the muscles that span the joint contract pretty constantly; if they can be kept quiet, the fragments can be kept in place better, but it is almost impossible to do that; the muscles will contract. Those muscles that move the bones will keep the fragments displaced, or, if attached to the joints in any way, as they move they will keep the fragments displaced.

There is one principle here of treatment in these cases which I have always emphasized, and which I think is exceedingly important, and which is little understood, and, so far as I know, is not announced in any text-books on fractures, or fairly considered. We have been taught—I was taught the importance of a thorough reduction. I admit that importance; but the very words I have been speaking now I think show, or at least they show my conviction, that these reductions cannot be perfectly maintained. But in time, as the swelling is relieved by absorption, what can be done is to mould these fragments in place from week to week and from day to day, every day pushing them more and more in place as you can, and in that way, by this constant moulding of the fragments of bone, they can be more nearly got into place than in any other way. I advise this principle of moulding as the fragments are uniting whether it is joint fragments or not, and I believe that a more perfect result can be obtained by this means than by any other. In fact it does not require that care in splinting that is needed when we allow them to go without this moulding process. I would emphasize this. I am sure that it is one of the leading lines of treatment in fractures that involve joints. Not only that, but a very careful and thorough, though gentle and intelligent passive motion, manipulation of these parts, I regard next to this moulding as essential to the best result. But do what we will as to the reduction of displaced fragments, as to moulding them in place when they are growing together, if they do grow together, by bone or ligament or whatever way they do grow together, do what we will there is a great diversity of result; and I wish to say only a few words on this point, but as clearly as possible. We cannot tell beforehand what

case is going to turn out favorably and what one is not. In some cases we may take but very little care, and the result will be but very moderate disability and only little deformity; in other cases, if we take very great pains, there will be remarkable deformity and great disability. And this does not depend entirely upon the surgeon; it depends much upon the condition of the patient, so far as I can judge. I have seen cases that yielded motion to some extent only after months and months of very careful and persistent passive motion, and I have seen others that have turned out well without any passive motion, that have almost taken care of themselves. The 'obstruction to motion is largely caused by the extent of new material that is thrown out by the displacement of the fragments, and in my experience it has been very considerable. I find that whenever a joint is injured, no matter how slightly, that circle of dynamic influence, the nerves of the part and the muscles that lie back of those nerves, the sensitive nerves and the muscle are acted upon, and the nerves of nutrition that go to the joint are affected as well, and the entire joint is disarranged. Over and over again have I noticed that; and we may have that more or less complete, and it may be so considerable that the parts will never regain their ability; they will be disarranged permanently, not very greatly, but disarranged. And, as I have often remarked, I have often been impressed with that fact, and for many years I have no longer been dogmatic upon those points. When a surgeon claims by a special process of treatment, by special apparatus, to accomplish wonderful results, I feel at once deeply impressed with the fact that he has not at all mastered the subject, for I see the best surgeons fail in bringing out what we might call desirable results; I see surgeons that are intelligent but have no claim to special experience get admirable results, one with one process and one with another. And it is with the purpose of bringing this difficult, this practical and important subject before the Surgical Society to elicit views upon these points, and to bring about a better understanding, a higher degree of tolerance, one with the work of another, a recognition of good points brought about by other men, a careful criticism of good points as other men state them, and a fuller and fairer estimate of this difficult subject—none more important than that of giving the injured patient the best use of his limbs possible under the circumstances, so that he shall have movable joints, the best we can give him.

Dr. PILCHER. — It has given me very great pleasure, Mr. Chairman, to listen to the statement of views which has been made by yourself in regard to this very important subject, and I know I shall be pardoned if I take the suggestion which is made by the Chairman to express views which may be in some respects at least divergent from those

which he himself has made, although I should hesitate very much to in any way put my experience in opposition to the very extensive experience upon which his own views are based.

The difficulties which are connected with the accurate diagnosis of fractures involving joints are well recognized, and perhaps from these arise largely the difficulties in treatment, the uncertainties which we experience in coming to an opinion as to how our treatment should be addressed to a given case. And out of this, likewise, must grow frequent lack of perfect success in what we aim to accomplish for our patients. I would suggest, as an additional help in diagnosing fractures of an obscure character about joints, in addition to the measurement of the width of the bone as compared with that of the sound side, that of the elicitation of points of special tenderness upon pressure. The two things which we are most likely to confound with fractures involving joints are dislocations and sprains. In both of these there are no new points of special tenderness to be found in the tissue of the bones themselves other than may be present at well recognized points of insertion of ligaments and ligamentous structures, and the special tenderness in soft parts produced by direct violence upon them. This being eliminated, one may often receive help in coming to a conclusion as to the character of the injury in obscure cases if points of particular tenderness are elicited by pressure at any point along the bones, by which symptom a lesion of the bone is indicated.

Then, with regard to the rather broad statement that the results of a case seem many times to depend to a very little extent upon the treatment which was adopted, that under the best of treatment poor results are often obtained, and that under various kinds of treatment, many apparently objectionable, equally good results are obtained. It seems to me that this ought to be qualified a little more, for otherwise there would be but little to incite a young surgeon to endeavor to compass that familiarity with these injuries and all their varied complications and relations which would make it possible for him to address his treatment skilfully to any particular case. I am inclined to think that the more intelligently treatment is addressed to the conditions presented by the case, the more certain of good results will a surgeon be. And I am sure that our Chairman, or any other gentleman who will engage in the discussion, will agree with me there. And yet I am led to make this statement simply because it seems to me to be called out by what was apparently, and I believe only apparently, of a different tenor in the remark that was made.

I would like to question very much, likewise, the desirability of attempting to secure a proper cementing of the bony fragments together by frequently interfering with them during the process of union, which

must be done if any such thing as gradual moulding of the fragments in the course of treatment be attempted. It seems to me that at as early a period as possible in the course of the case the fragments should be brought into the best possible relation to each other, and that, this having once been accomplished, they should be entirely and absolutely let alone thereafter, provided it is possible to obtain means to support them without disturbance in that position; and that every effort should be made by means of position, support, and immobilization to keep the fragments in position when once we have put them there.

That leads me directly to the consideration of the propriety of passive motion in the treatment of fractures in the neighborhood of joints. It has seemed to me that every time a motion was impressed upon a joint in the immediate neighborhood of which there was a fractured bone, that by so doing we disturb the process of repair at the point of fracture, we increase local irritation, we excite excessive plastic exudation, we aggravate the amount of callus which is thrown out, we cause among the periarticular tissues the collection or formation of plastic exudate which tends to cement them together and to limit their future functional activity; while, at the same time, we delay somewhat the perfection of the reparative process at the injured point itself. If I am correct, and the limited experience which I have had in the observation of these cases, had I time to marshal it, I think would sustain my position. If I am correct, the proper conclusion is to carefully avoid passive movements of these affected joints, or these joints the bones entering into the formation of which are injured near the joint, until full and complete repair of the lesion in those bones has been accomplished, until the inflammatory effusion necessarily following the injury has been absorbed, until the parts are in as nearly a normal condition as it is possible for them to be brought; and that even then violent passive motion should be carefully abstained from, but that the parts should be left to the progressive physiological restoration of their function, a condition of affairs which all of us, I am sure, have been able to watch, as we have seen joints which were apparently nearly ankylosed when put to use gradually becoming more and more extensive in the excursions to which they might be subjected, until nearly complete restoration of the function of the parts had been accomplished. I am quite aware that this is in direct opposition to the teaching of some of those authorities upon the subject of these injuries which we look up to as of the greatest note.

In connection with this, however, there is another thing to be noted, namely, that when there are in the neighborhood of an injury of this kind long tendo-synovial sheaths they will, if they become irritated, fill with a plastic effusion, which, if long immobilization in that

condition is done, may fasten the tendons in their sheaths by dense adhesions. Such conditions form an exception to the rule. In these cases we have to decide as to which injury or danger is the greatest, that which would arise from the disturbance of the fracture of the bone or that which would arise from the disuse and ankylosis of important tendons in long synovial sheaths. Such, however, is not the condition about the elbow nor at the knee; at the wrist, at the shoulder, and to some extent at the ankle, it is present.

In dealing with all these injuries, it seems to me we must take into consideration the anatomical peculiarities of the special parts involved, and bring our treatment to bear upon the particular conditions which may be presented there.

I would like to re-inforce what has already been said as to the dangers from the use of pressure in our attempts to keep the deformity reduced. If the deformity cannot be kept reduced by position, by muscular relaxation, and by immobilization, no help will be gained by attempting to accomplish it by pressure upon the point; it will certainly lead us into dangers and into difficulties. But with first reduction, then muscular relaxation, then gentle support, and finally immobilization, I believe we have the elements for the most successful treatment of all fractures involving joints.

Dr. WIGHT.—I would like to make a very simple statement with reference to the final prognosis. I consider, as everybody would, that those who are most skilful will produce the best results, and perhaps I didn't make that clear enough because it was so clearly understood in my own mind; but I can see that if that was the way in which I made myself understood, the criticism would be entirely just. But it was or should be qualified by the word "apparent;" but while there is great diversity, those who have the most skill will bring about the best results.

Dr. BOGART.—I think almost any one who has seen and treated many fractures in the vicinity of joints will have something to say upon the subject, because I presume every one who has had much experience has had good results and bad results.

I would like to give a general endorsement to almost everything that our worthy President has said upon this subject. I have had the advantage of his counsel in a number of cases, and have seen a good deal of his work and listened a good deal to his teaching upon the subject, and it has all served to impress me with the great ability of his diagnosis and treatment and the excellent results that he has obtained.

I will also subscribe to some of the modifications suggested by the last speaker, but on some points I would incline to take a middle

ground. When I began to see a good many fractures in the vicinity of joints, I was very strongly impressed by some remarks made by Dr. John C. Warren, of Boston, upon the necessity of beginning vigorous passive motion at once, and having it continued during the course of treatment. I set out to treat fractures in the vicinity of the elbow-joint in that way. Some of them were kind enough to do well under the treatment, and others did very badly. I remember some cases which were under vigorous and continuous passive motion every two or three days, in which the mobility of the joints grew less and less, while the amount of callus increased, until I desisted from my efforts altogether, when, to my surprise and gratification, the motion returned and the redundant callus was absorbed.

Now I have come to think that after repositing displaced fragments and applying suitable retentive apparatus, for the first two or three weeks most fractures in the vicinity of joints had better be left alone, except so far as to see that the fragments still maintain the position in which they were placed. After that, careful manipulation should be made, to any extent which does not cause the patient severe pain. I think such motion does good in lessening the amount of restriction, which is likely to result in the motion of the joint. I should certainly most emphatically object to making any vigorous passive motion while the fragments are in process of uniting. Rather than do that I would wait, and, after the union of the fragments had been completed, give an anæsthetic and break up the adhesions forcibly.

The more I see of fractures and dislocations, the more I am impressed with the importance of making an accurate diagnosis before beginning treatment, and the more I am inclined to leave no stone unturned to make my examination as complete and careful as possible. In some cases I therefore advise an anæsthetic. More thorough examination can be made, with less damage to the injured part, and the gain in intelligence in our efforts to treat the fracture is sufficient to warrant giving it.

Of course there is none of us who has not been impressed with the importance of throwing aside set rules and treating these cases individually.

I quite agree with the others that reduction of the displacement is often not only difficult but impossible. I also agree that no very great force can be exerted in keeping up reduction; that unless the displaced parts can be put in proper apposition, and maintained there, or nearly so, by some position in which the joint can be placed, there is not very much hope of retaining them by means of any apparatus that we may apply.

I am disposed to think with Dr. Wight that a good deal may be

done in the way of moulding, and I think that in this respect there is a difference here from fractures in the shafts of bones. The danger of non-union is less, and *careful manipulation* does not seem to increase the amount of callus. I am sure I have seen good results from this process, and I am indebted to Dr. Wight for having called my attention to it.

Dr. RAND.—It appears, Mr President, that the discussion has turned to a consideration of the question of passive motion, which has long seemed to me to be one of the most important subjects in connection with the treatment of fractures involving joints. I have seen a large number of fractures involving elbow-joints, and for some years followed the rule laid down by Erichsen and others and waited for three weeks before beginning passive motion. The result was, in many cases, a great amount of disability, and a disability persisting for a long time, if not permanently. And that, too, where the reduction was as good as could be accomplished and where there had been no undue amount of reaction following the injury.

Some years ago I adopted the practice advocated by Hamilton and others, of beginning passive motion in these cases early, by the sixth or seventh day, where there was no unusual amount of inflammation in the joint that would contraindicate it.

In the case of either condyle, even if the fracture is multiple, the part can be so held by the hand that gentle passive motion can be made by the surgeon so as not to disturb the relation of the fractured surfaces. Such passive motion gently made will, I think, even thus early, favor the absorption of so much of the exudation as encroaches upon the joint, rather than increase it; and whether we treat a fracture involving this joint in the ordinary position of flexion of the forearm, or in the way advocated by Lowenstein and others, with the forearm extended and supinated, I believe that better results will be obtained in the majority of cases if passive motion is begun by the end of the first week than if longer delayed. Of course I would deprecate anything like violent passive motion.

Dr. WIGHT.—I had in my mind to relate two cases touching upon this point that seems to have taken the lead, one indirectly and the other pretty directly, out of a large number of direct cases which occurred in my earlier years of practice, which impressed me at the time and which have influenced me since.

I was treating a case of fracture of the left arm-bone, under the direction of one of our leading surgeons. It was put up very nicely in an angular splint, and union took place in about four weeks, and the apparatus was kept on all that time under his direction. This was not a case of fracture in the joint, but it involved this question. At the

end of that time he told me to take this splint off, and I did so, and the elbow was perfectly rigid. He told me to make passive motion in it. I tried and didn't get on at all, and finally I told him I didn't know how, and he showed me. Said he, "This is the way to work it," and the first stroke took the arm right off again. I then anæsthetized the patient—the patient wouldn't have anything more to do with the principal—and I carefully broke up that joint. It required a good deal of force. I remember that I used pretty much all the strength I had, but I succeeded in breaking it up and getting it so it would move; then I put up the fracture, and I took that down with great care, the whole thing, took it off, and I held this upper portion of the bone and moved the hand up gently all the way it would go and down again, then put on the splint, and in three weeks time the union was firm and solid and the man could use his forearm without any difficulty. That involves the question of careful passive motion.

Another case of a little girl who fell and broke off the lower epiphysis of the radius, and I mention that because it was in connection with the late Dr. Dodge, who was, to my mind, a very careful and judicious surgeon; and with his advice and assistance, from the very beginning we kept up passive motion in that wrist, and the result was, in about six weeks, as complete as anything I ever saw, and I think the record is on one of the old dispensary books. There was a constant tendency of the ankylosis to get back, but by that constant motion the epiphysis not only grew on right and firm and solid, but the joint was mobile.

I could enumerate now, by looking at my notes, a great many cases that bear upon this special subject. I am inclined to be, as Dr. Rand is, rather in favor of early passive motion in these cases.

I will add one thing in another case. A little girl living out in the eastern part of the city, whom I treated for fracture of the left internal condyle leading into the joint when she was a baby had scarlet fever at the time, which complicated the treatment; but I carried out the same principle there. She had a new joint betwixt the fragment and the bone, with very little deformity but excessive motion, the motion more complete and extensive in that elbow than in the other, and it doesn't show at all.

My opinion is this: I would rather have a new point of motion, a new joint betwixt the fragments, if one is not large, and the other the main part of the bone; I would rather have that with the fragment ankylosed to the other part of the joint; I would rather have that with a plenty of motion here in the elbow, for instance, than to have a stiff elbow with an ankylosed fragment. I have accomplished such a result as that, and I consider it good success to have good motion rather than to have moderate deformity with little motion.

I will add, if you will allow me, one thing more : I am not inclined to criticize those who take the other view, for I can see the reasons for it ; I have seen a good many cases that turned out well under that treatment. And I may not say I shall always hold the views I have now, for as I grow older I get more liberal towards the views of other men.

NEW RESEARCHES ON THE ETIOLOGY AND TREATMENT OF TETANUS.

TRANSLATED BY GEORGE T. KEMP, PH.D.,

Associate Director of Physiology and Bacteriology, Hoagland Laboratory.

The *Journal de Médecine de Paris* for January 13 and 20, 1889, contains an excellent résumé, by M. Guelpa, of recent investigations on the *Ætiology and Treatment of Tetanus*. This work includes many new and interesting observations which offer almost conclusive evidence that the germ of traumatic tetanus has been discovered, and a further study of its habitat offers valuable suggestions for treatment.

Carle and Rattone¹ and Nicolaier² have proved the inoculability of tetanus beyond doubt. Rosenbach, in continuing these observations, was able to demonstrate the presence of a peculiar bacillus amongst the other organisms found in the pus from the wound. This bacillus was long, very slender, and had a knob-like swelling at one end.*

Rosenbach³ not only found these bacilli in pus from the wound, but in six per cent. of the cases he was able to show their presence in the spinal cord. The bacillus is anaerobic and offers special difficulties in its cultivation. It appears that Flügge and Nicolaier have claimed that they have succeeded in obtaining it from culture, but their method has not yet been published.

Giordano,⁴ in 1887, inoculated guinea-pigs and rabbits with cultures from the blood, spleen, nerves, spinal cord, and *superficial* pus from the wounds of tetanic patients. His results in these cases were negative, and he failed to find the bacillus of Nicolaier. Pus from the *deeper* portions of the wound never failed to produce tetanus, and the characteristic bacillus was present in every case.

In the earthquake of 1887, in Italy, several villages were badly wrecked, and in the little village of Baiardo a number of persons were

* These bacilli were also known to Nicolaier, who refers to the knobbed end as a kind of spore formation. See Flügge's "Mikroorganismen," ed. 1886, p. 275.

injured by the falling of a church in which they had taken refuge. Among these, a number were attacked by tetanus. At the neighboring village of Diano-Marina a number of persons were injured, but no tetanus developed in these cases. The cases in these two villages came under the observation of Bonome,^{5, 6} who examined the earth from the two villages, and found that a search for the Nicolaier bacillus, "by staining, cultures, and inoculations, of fragments of débris," yielded negative results for Diano-Marina, while identical researches with similar material from Baiardo invariably yielded positive results. The bacilli were not found in the blood, cephalo-rachidian fluid, central nervous system, nerves, nor internal organs, and inoculations from these gave negative results. Pus from the wound always furnished the organism, and inoculations were, without exception, fatal. An exposure to 100° C. did not kill the bacillus nor destroy its pathogenic properties. When a large dose of pus was given, and death supervened rapidly, there were no specific bacilli in the wound, but peculiar corpuscles colored by fuchsin were seen.

A very interesting observation, analagous to those of Bonome at Baiardo, was made by Beumer,⁷ who ascertained where two patients had received wounds from which tetanus resulted, and then proved by inoculation that the dirt at these places would produce tetanus, recovering the Nicolaier bacillus in each instance.

Morisani⁸ corroborated the work already quoted by an examination of one case of tetanus, with the discovery of the Nicolaier bacillus. He also made successful inoculations.

Rietsch⁹ produced tetanus in guinea-pigs by inoculating them with dust from hay. From the guinea-pigs he inoculated an ass, which also died of tetanus.

Another interesting case is reported by Belfanti and Pescarole.¹⁰ A woman applied for admittance to their hospital. She was suffering from two wounds on the thigh produced by a kick received two months previously. Being shockingly dirty, a warm bath was ordered, but no sooner had she been put into the bath than she was taken with a terrible attack of tetanus which involved the diaphragm, so that she died in a few minutes. Belfanti and Pescarole not only found the Nicolaier bacillus in the exudate of the wounds, but, furthermore, they isolated a new organism, which they found in the thick scrapings of dirt from the body as well as from the wounds, but not in the blood. They describe this new organism as formed like the bacillus of chicken cholera, but much smaller. They have a rapid motion at 25°, and multiply by fission (division observed in one hour). In general they are colored by the ordinary methods, with the exception of Gram's, and sometimes they show polar staining. This bacillus was fatal for

rabbits, guinea-pigs, rats, and sparrows, and produced vomiting, diarrhoea, and fever in a dog. The affection was of a paralytic nature.

Ferrari¹¹ has claimed to produce tetanus with an anaerobic staphylococcus which he obtained from blood drawn from the finger by puncture several hours before the death of a woman who was taken with tetanus after ovariectomy.*

That the pin-shaped bacillus of Nicolaier is probably the true one, is rendered almost certain by the well-known researches of Brieger,¹² who isolated a ptomaine (tetanine) from cultures of Nicolaier's bacillus sent him by Koch. This ptomaine, when injected into an animal in exceedingly minute quantities, will produce typical tetanus.

It must be admitted that the Nicolaier bacillus has not been isolated from other organisms; but the fact is also prominent that it is always present in wounds which produce tetanus, and it is the only one whose presence in such cases has been shown to be constant. The most successful observations have only demonstrated the presence of Nicolaier's bacillus in the central nervous system in five per cent. of the cases examined, and most investigators question the accuracy of these observations and deny its presence there altogether. Still less valid is its claim to having a nidus in any of the internal organs. On the other hand, its presence in pus has been established beyond doubt, and Brieger's isolation of its soluble product, tetanine, readily explains how the bacillus may multiply in the wound, and its poisonous ptomaine be absorbed by the blood and thus exert its toxic influence on the nervous system. This conception of the local nidus of the poison-producing bacilli has a direct bearing on the method of treatment recommended later.

At a meeting of the Therapeutic Society, Guelpa was asked by Dujardin Beaumetz how he would harmonize the theory of infectiousness of tetanus with that form of tetanus which decreases from day to day, and which is called rheumatic tetanus. Guelpa replied that he did not believe any isolated form of tetanus existed, but thought that rheumatism possibly affected the cells of the body in such a way as to diminish their power of resisting the bacillus, or, in other words, rheumatism acted as a predisposing cause. He refers to experiments showing that the bacillus in question is found in hay, earth, and walls, and says that with the system affected by rheumatism, the bacilli might enter through lesions in the alimentary tract, and overcome the cells, while, in the healthy individual, the bacilli would succumb. To support the assumption that tetanus may be produced through the

* None of the other investigators of tetanus has found this staphylococcus, and Ferrari's results were either due to a contamination of his culture or he has succeeded in isolating a distinct organism also capable of producing tetanus.

alimentary canal, he cites two cases, one of a man who was cured of tetanus by thoroughly washing the stomach, and another very important set of cases, where several slaves were taken with tetanus after eating the flesh of a steer who died of tetanus following castration.

Guelpa sums up his conclusions under seven heads :

1. Tetanus is an infectious malady.

2. There is no such thing as rheumatismal tetanus in the true sense of the word.

3. Although the horse is one of the most susceptible animals to the malady, it is certain that tetanus is not of equine origin: Verneuil to the contrary notwithstanding. It would be much more proper to attribute it to microbic origin, the microbe being found in the earth.

4. The symptoms of tetanus are not due to the microbes, but to the toxic substance generated by them.

5. At least during the first manifestations of tetanus the multiplication of the microbe is limited to the place of entrance. In only six per cent. of cases do we find the organism all through the body.

6. While opposing the nervous theory of tetanus, it is nevertheless true that the nervous system has a particularly marked susceptibility to react to the ptomaines produced by the organism.

7. From a therapeutic point of view, there are three essential objects to be attained :

a. The destruction of the nidus of development of the bacilli.

b. The elimination from the system of the products of the bacilli.

c. The sedation of the nervous system.

To destroy the bacilli in their nidus deep excoriations are made, and the place washed with five to ten per cent. of sublimate, or cauterized with nitric or sulphuric acid. He recommends elimination by purgatives and diaphoretics.

The sedation of the nervous system is accomplished by sedatives and, above all, absolute quiet.

Note well the danger of eating flesh of animals dead with tetanus.

LITERATURE.

¹ Carle e Rattone. Studio sperimentale sull'eziologia del tetano. Turin, 1884.

² Nicolaier. Ueber infectiosen Tetanus.

³ Rosenbach. Centralbl. f. Chir., 1884, p. 24.

⁴ Giordano. Contributo all' eziologia del tetano. Giornale de l'Accademia di Medicina, Turin, 1887.

⁵ Bonome. Sull' eziologia del tetano. Giornale del Accademia di Medicina, Turin, 1888.

⁶ Bonome. Ueber die Aetiologie des Tetanus. Aus dem anatomischen pathologischen Institut der Universität Turin. Fortschritte der Medicin, 1888 (?).

⁷ Beumer. Centralbl. f. Chirurg., 1888.

⁸ Morisani. Ricerche sperimentale sull' eziologia del tetano traumatico. La Riforma Medica, 1887.

⁹ Kretsch. Semaine Medicale, Aug. 7, 1888.

¹⁰ Belfanti and Pescarole. Giornale dell' Accademia di Medicina. Turin, June, 1888.

¹¹ Ferrari. Sull' etiologia del tetano delle ferit nell' uomo. Archivio ed atti della Società Italiana di Chirurgia, April, 1887.

¹² Brieger. Sur l' étiologie du tetanus. Actes de la Société de Médecine interne de Berlin, April, 1887.

THE WHEREFORE.

[From the Boston Med. and Surg. Journal.]

A man of modern science wooed
 A maiden of accepting mood,
 Who, dreading lest contagion might
 Do mischief to her chosen wight,
 With sol. bichloride washed her hair
 And sponged her limbs and body fair.

She rinsed her mouth with "Listerine,"
 And held, her snow-white teeth between,
 A pad of antiseptic gauze,—
 Covering her nose, as well as jaws,—
 Which formed a sort of respirator
 Between them and her "osculator."

But this reminds,—I should have told
 That these were things he'd taught of old,
 With others which I may not tell, in
 Regard to spots that germs might dwell in.
 She was a wise professor's daughter
 And practised all which had been taught her.

So this good medicine man, with pride
 Claspings his antiseptic bride,—
 In disinfected murmur low
 Asked "why she loved her doctor so?"
 And, softly nestling down, she sighed,
 "You're such a dear old germicide."

C. V. G.

THE BROOKLYN MEDICAL JOURNAL.

EDITORIAL.

THE TRAINED NURSE.

The nurses have gone into journalism. We have just added to our exchange list "The Trained Nurse," a neatly gotten up journal, "consecrated to those who minister to the sick and suffering in hospital and home."

Margaret Elliot Francis is the able editor, and it is published by the Lakeside Publishing Co., of Buffalo, N. Y.

The table of contents of the April number includes "Articles for the Mother's Use," by H. C. C., of Brooklyn, a monograph full of practical hints on the armamentaria of the parturient chamber: "The Relation of Hospitals to Medical Education" which is not signed by its author, "Paranoia: its Causes and Cure."

Dr. Herman Laurence furnishes an interesting article on "Health in our Homes." The article on "Asepsis for the Nurse" is very timely and to the point, for prevention is the watchword of surgery at the present time, and nurses failing to carry out these principles are responsible for many evils.

THE BROOKLYN THROAT HOSPITAL.

The opening of the Brooklyn Throat Hospital recently in the Eastern District of our city adds another institution to the list of Brooklyn's medical charities. The new hospital is of an exclusive character, and will be devoted entirely to the treatment of the diseases of the nose, throat, lungs, eye and ear. The necessity for an institution of this description in the Eastern District seems to be demonstrated by the records of the dispensary attached to the hospital. During the two months it has been in operation seven hundred and fifty treatments have been made.

The equipment of the Brooklyn Throat Hospital is unsurpassed in its completeness. The directors determined to have everything that

would facilitate the treatment of disease, and they have admirably succeeded in carrying out their intention. The nose and throat department is furnished with a complete outfit of electrical apparatus, made especially by the Waite & Bartlett Manufacturing Company, of New York. The air supply is furnished by a large Nash gas engine, which pumps the air into a large storage reservoir. The outlets have silk-covered tubing with metal cut-offs. A large table, twelve feet in length, is used by post-graduate students. It accommodates six physicians, each having a student's gas lamp, with a reflector and condenser, an air outlet, cotton, waste and medicine boxes, drawer for instruments, towel-rack, etc. The ear department is separate from that of the eye. This is certainly a novel feature, the intention being to associate the ear with the nose and throat; but it is conducted as an independent department, and has its own staff. The outfit of the ear section is complete, having everything necessary for the work.

The pulmonary department is furnished by the gas engine with sufficient air to supply six improved Evans' inhalers. A novelty is to be seen in the large respiratory chair intended to produce artificial respiration. Nothing need be especially said in reference to the eye department. It contains everything that a first-class clinic should have. The Spencer Optical Company has recently put in one of its large sets of lenses. Adjoining the refraction room is the ophthalmoscopic room.

The hospital proper is not as yet in complete running order, and contains but two cots, although this number will be increased to twelve during the coming fall.

The staff consists of surgeons, assistant surgeons, physicians, assistant physicians and clinical assistants. A by-law makes it necessary for a practitioner to be an exclusive specialist to become a surgeon. The physicians are connected only with the pulmonary department. It is not intended to have a consulting staff. The staff is selected subject to the approval of the executive committee of the New York Post-Graduate Medical School, under whose auspices the medical and surgical work at the Brooklyn Throat Hospital is conducted. The staff contains the names of some well-known physicians. A list of them will be found in the hospital advertisement.

PRELIMINARY EDUCATION FOR MEDICAL STUDENTS.

An act to supply this long-felt want has at last been passed by the New York State Legislature, and goes at once into operation. Its *modus operandi* has not yet been definitely determined, but the Regents

of the University are now making arrangements for the examinations, and will announce them shortly. We publish the act in full in this issue.

The following letter, recently received by the officers of a medical college, will show the advantage which the medical profession will derive from the exclusion of such ignoramuses as its writer from the ranks of the profession. Unfortunately the individual in question has "already entered upon the prescribed three years' study of medicine," and does not, therefore, come under the law. The letter is as follows :

MY. DEAR. SIR.

Yours

of the 8th. inst. received, and, contents noted. And refering to, your communication, I find, that you will require me to attend an other course of lecturs. But I think if I write you. and, explain, my position, that your faculty, will perhaps, reconsider the matter. & conclude to give me an examniation, for the degree, of MD.. I have attended two, 2, full, courses of lecturs, and was goeing to take third course, buh I have, sudenly become embarresed, and I find, I can not take an, other course. I. have stood, three examaiation.s, before. the different State, board,s. and, passed them succesfully. and, woule, like to have a. diplomia, if I only could get the chance to get one, if you can not, grant me this favor can. you tell me where I can get one, I. do not care any thing a. bout the repetation of the school, for if any of the State, board,s. were to reject it I can stand an examniation. as. I. have always done be fore. I. onely want it for the public, to look at. ? Please give me all the information you. can, if, you can not give me and examniation.

I have the tickets to show as evidense. of my attended siged by the Dean.

Please let me hear from you again soon
and. oblige your,s. &SO.,



The Secretary of the Long Island College Hospital is desirous of obtaining a set of the official announcements of that institution prior to 1878. Any one having copies of any of the above mentioned announcements will confer a favor by sending them to J. H. Raymond, Long Island College Hospital.

PROCEEDINGS OF SOCIETIES.

THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

A regular meeting of the Society was held at its rooms, 356 Bridge Street, Tuesday evening, June 18, 1889, at 8 o'clock, Dr. Matheson, President, in the chair. There were about fifty members present.

The minutes of the last meeting were read and approved.

The Council reported for election to membership the names of the following gentlemen: Drs. Frank E. Wilson, John R. Kevin, William H. Skene, Alex. Rae, Adam Schauf and Robert Swan.

The President declared the following gentlemen elected to membership, viz.: Drs. Henry B. Delatour, Harry Kent Bell, Francis E. Wilson, Alex. Rae and William H. Skene.

The following Doctors were proposed for membership: L. A. W. Alleman, 38 Schermerhorn Street, Jefferson College, Philadelphia, 1886; proposed by F. P. Hudnut, M.D., seconded by A. Ross Matheson, M.D.; Robert Swan (U. S. N. retired), 74 State Street, College Physicians and Surgeons, N. Y., 1874; proposed by John C. Shaw, M.D., seconded by William Hutchinson, M.D.; William S. Applegate, Flatbush, Jefferson College, Philadelphia, 1883; proposed by Homer L. Bartlett, M.D., seconded by John L. Zabriskie, M.D.; Madeline Marquette, 176 St. Johns Place, Gross Medical College, Denver, Col.; proposed by Joel W. Hyde, M.D., seconded by A. Ross Matheson, M.D.

SCIENTIFIC BUSINESS.

The first paper of the evening entitled, "A Case of Tubercular Disease of the Ankle-joint," by Dr. George Wackerhagen, was read, and discussed by Drs. Sydney Allan Fox and Thomas L. Rochester.

The second paper of the evening, entitled "Severe Continuous Cephalalgia as an early secondary in Syphilis," was read by Dr. William Browning, and discussed by Dr. Hall.

The third paper of the evening, entitled "Contribution to the Study of Typhoid Fever in Children," was read by Dr. Henry N. Read, and discussed by Drs. O'Connell and Wallace.

The report of the Obituary Committee on the death of Dr. Francis Warren Rockwell, was read, and on motion the report was adopted and the committee discharged.

On motion, a copy of the memorial was ordered to be engrossed and sent to the widow and family of Dr. Rockwell.

There being no further business, on motion, adjourned.

W. M. HUTCHINSON,
Secretary.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

Subjects for September Meeting (Sept. 17th).

"A New Curette for Curetting the Male Bladder." By George G. Hopkins, M.D.

Report of Committee on Practice.

"Typhoid Fever: Etiology and Prophylaxis." D. F. Lucas, M.D.

"Diagnosis." Stephen E. Fuller, M.D.

"Treatment." John A. McCorkle, M.D.

"Complications and Sequelæ." William Maddren, M.D.

Members desiring to discuss these papers will confer a favor by sending their names to the President, Dr. A. Ross Matheson, 337 Union Street.

THE BROOKLYN DENTAL SOCIETY.

The annual meeting of this society was held June 24th. The reports of the Secretary, Corresponding Secretary, Treasurer, and Librarian were read and accepted.

The following officers were elected for the ensuing year: President, Dr. Chas. D. Cook; Vice-president, Dr. E. T. Riffner; Recording Secretary, Dr. Louis Shaw; Corresponding Secretary, Dr. S. F. Cook; Treasurer, Dr. F. C. Walker; Librarian, Dr. L. G. Wilder.

The newly elected President afterwards appointed the following standing committees for the year 1889-90:

Executive.—Wm. Jarvie, Jr., O. E. Hill, M. E. Elmendorf.

Ethics.—C. B. Parker, C. P. Crandell, F. W. Moore.

Subjects.—Will. H. Johnston, A. H. Brockway, R. C. Brewster.

Membership.—H. G. Mirick, J. J. Pitts, Wm. A. Campbell.

Clinics.—F. T. Van Woert, J. P. Geran, Geo. W. White, B. A. R. Ottolinguì, C. S. Van Orden.

PROGRESS IN MEDICINE.

DISEASES OF THE SKIN.

BY SAMUEL SHERWELL, M.D.,

Clinical Professor of Dermatology, Long Island College Hospital; Attending Physician Brooklyn Hospital; Surgeon to Skin and Throat Department, Brooklyn Eye and Ear Hospital.

THE ETIOLOGY OF ALOPECIA AREATA.

H. Leloir, Paris (Gazette des Hopitaux, June 30, 1888). The author refers to the recent writings of A. R. Robinson and the German authorities on this subject, and gives a *résumé* of his observations, treatment, etc., of 142 cases, the whole of which he has seen in one year! In 92 of these cases he had every opportunity to study closely as to probable etiology, as well as course, and so forth. These 92 he divided into three classes. 1st. 36 in whom he could find no history or trace of anything save nervous cause. 2d. 35 in number, in these he can find no direct reason for belief in any nervous origin, or over-irritation of the scalp in any way, or any traumatic influence; nor can he by closest examination find any trace of its being derived from contagion, or being contagious to others. 3d. 21 cases, which from history seem to be caused by contagion or to have such an element present in themselves. Hence he is led to similar conclusions with Besnier, Lailier, Vidal, and the authors quoted above, that this disease must be divided into those having a nervous, the others a parasitic origin. He gives many and striking instances of the occurrence of this disease as a distinct tropho-neurosis, in some cases result of nervous shock, as its coming on shortly after death of near friends (9 or 10 days), bankruptcy, etc.

TRANSPLANTATION OF THE SKIN OF A CORPSE TO A LIVING PERSON.

Dr. Bartens, Roda (Berlin. Klin. Wochschft., p. 649, No. 32, 1888). This most extraordinary and successful case of grafting deserves chronicling at some length.

“Paul H., æt. 14, employé in a brewery, was scalded severely on both legs and feet on the 21st October, 1887; was treated in a general hospital and in a general way for ten days; came immediately under Dr. M.’s hands, October 31, 1888. The condition in brief was as follows: The skin on both legs and feet for about three to six c. m.

above malleoli was entirely destroyed and gone, with exception of both soles, which were only partially destroyed; and a little of the skin tissue between the toes and the upper surfaces thereof. The wounds were very painful and secreting pus freely.

Efforts at healing were made by careful strapping, iodoform, touching with sols. of argent nit., potass permang., etc. The wounds healed when it might have been expected they would, around toes, etc., but the rest of the ulceration remained in *statu quo*. It became a question of transplantation. How to carry this out? The patient too weak and anæmic himself, suffering from pus discharge of original wounds, to think of supplying the necessary skin himself; and, owing to the large surface of tissue demanded, no one else willing to sacrifice themselves to the extent the nature of the case demanded.

On December 13th (same year), however, an old lunatic, æt. 75, died, in another ward of the hospital, from pyæmia, as a result of a complicated fracture of the arm. With the assistance of a colleague attached to the same institution (Dr. Werner), Dr. Bartens removed, about twenty minutes after death, two large, good conditioned flaps from the legs of the corpse. These were laid in warm water to which a little salt had been added, and then were taken to the division of the hospital (two or three hundred yards away) in which the scalded boy lay. These flaps were then carefully washed and cleansed of their subjacent fatty pannus; that done, they were divided into smaller pieces of from one c. m. wide to about one to two c. m. long (the ulcerated surfaces of the boy's legs had been cleansed in same manner as the flaps in the meantime); then these pieces were laid on to fit as nearly as might be, dusted over with iodoform and covered with batting, and compresses applied. This whole proceeding took about one hour and a half from the time of the death of the old man; there were twenty-eight pieces applied in all, as it happened, too, fourteen on each limb.

On the 19th December, the bandages were removed for the first time, and it was found that there was union of twenty-four of these grafts; four which had been applied over and around the malleoli came away with the old bandage, a few of the edges of the adherent grafts were a little discolored, it is true, but as a rule their condition was good. The surface was again cleansed with a sol. of potass. permang., and bandages reapplied; ten days thereafter the bandages were again taken off; all was found in good condition, granulation going on everywhere around the edges, and sensibility to touch was manifest in the transplanted skin. The open sores over and around the malleoli were later endeavored to be closed by same means, this time by pieces from the upper arms of patient himself, and by using the skin of one or two other recent corpses; but these efforts did not

succeed. Finally, by curetting the edges of the ulcers in these places, application of caustics and stimulants, massage, etc., these places also healed, so that on June 14, 1888, the patient was allowed to depart entirely well, movements, flexibility of limbs, etc., perfect.

ON THE CURE OF A CASE OF LEPROSY BY UNNA'S METHOD. (ADMINISTRATION OF ICHTHYOL INTERNALLY, OF CHRYSAROBIN AND PYROGALLOL EXTERNALLY.)

Dr. Dreckman, Vienenberg (Monatshft. f. pract. Derm., No. 23, p. 1180.

The author gives history of a patient of his, a Brazilian, æt. 42, with tubercular anæsthetic leprosy of the most typical kind according to description. The patient also had a wife who had suffered from the same disease eighteen years, who again had a brother who had been leprotic for twenty years. He (Dr. D.'s patient) believed that he had certainly contracted the disease from his wife.

In six weeks, according to Dr. D., with the treatment above outlined, he had caused in this individual such a subsidence, not to say disappearance, of the eruption and symptoms that he pronounced the man absolutely cured.

(A wonderful case and result, if constated by colleagues; as will be necessary.—S. S.

KRAUROSIS VULVÆ.

Janovsky (Monatshft. f. pract. Dermat, 1888, No. 7, p. 951).

The author reports six cases of this disease, to which the name was first given by Breisky, and adopted by Heitzmann in a paper read by him before Am. Dermatological Association, 1888; he reports four cases. M. Reclus, Paris (in Gaz. des Hopitaux, No. 74, 1888), reports a series of five cases which appear to be similar if not identical. The same disease has been described some fourteen years since by Dr. Robert F. Weir, New York, as "Ichthyosis of the Vulva." These authors all insist it is not to be identified with leucoplakia, or ichthyotic conditions, or syphilis, but that it is a disease coming on late in life, that has its seat in the vestibule, the labia minora, and in and around clitoris usually, then invading the labia majora, etc. A degree of atrophy and of stenosis of the parts results, and only the most radical and vigorous treatment is at all effective, as by ablation, *rac-lage*, the use of stronger escharotics, and subsequent milder treatment. The natural tendency of the trouble, if not interfered with, being by common consent an aptitude to run into a malignant form.

(It would seem strange that these conditions have not been oftener noticed, or mentioned by gynæcologists in this and other countries.)—S. S.

NOTES UPON A NEW METHOD OF TREATMENT APPLICABLE TO SYNOVIAL
BURSÆ, SEBACEOUS CYSTS, ETC., AND GENERALLY TO ALL
TUMORS NEAR THE SUPERFICIES.

H. Barth (Med. de l'Hopital Broussais, Paris, in *L'Union Médicale*, Jan. 15, 1889.) The author dwells at length on the desire of patients to be relieved from ganglionic tumors, sebaceous cysts, strumous cervical adenitis, and the like, by means they deem milder than that of the knife, and counsels the following proceeding, which, in spite of his not having a wide experience, he recommends highly in view of what it has done in the cases tried by him.

The procedure is the simple hypodermic injection (under antiseptic precautions) of $\frac{mii}{}$ of Fowler's solution into the substance of the cyst. He says, as one may well believe, that there is little pain, and none whatever if a little cocaine is added to the solution; he also says that this hypodermic injection needs no frequent repetition, that at most twice is sufficient to bring about relative if not absolute cure. There is, he claims, no danger of suppuration following. He quotes Wonewarder, who has used this method much and successfully in cases of lymphadenitis, but does not agree with him in his explanation as to the effect being due to its purely chemical action upon the tissues, but believes that an inflammatory condition of a certain conservative nature is set up, and that the resultant atrophic change in the growths results from the subsidence of that.

(The idea is not new, although the author evidently so considers it. Hypodermic injections of other medicants are often used, too, as acetic acid, iodine, or iodide of potassium, either alone or in combination, bichloride of mercury, etc.)—S. S.

ENGRAVING OF DERMATOLYTIC CASE.

J. A. Wetherall, M. B., Barnsley Union Hospital, England (*British Med. Jour.*, March 9, 1889, p. 527). The author publishes in this number of the *Journal* a very lifelike picture (woodcut from photograph) of a case of dermatolysis. In the text which accompanies it, it is easily seen that he knows, however, nothing about the disease in question.

LEPROSY IN PARCENT.

Dr. Zuriaga, of the Province of Alicante, Spain (*Annales de Dermatologie*, vol. ix., No. 6, p. 390). The doctor under the above title gives a valuable historical résumé, and, if the facts are as stated, apparently conclusive evidence as to the contagious character of leprosy, shown to have occurred in an isolated village in Spain.

The documents of the mayoralty, dating from 1849 up to the past year, have furnished the facts and figures chiefly, reinforced however, by personal and other seemingly reliable evidence. It would appear that the disease appeared there in the first year named, in the person of a male adult, it shortly afterward appearing in the persons of those with whom he slept, etc., and in those with whom he had the closest communion. Sixty cases in all have now been recorded in that vicinage, forty-five of whom are now dead.

The peculiar conditions of life observed there seem all to favor the theory of contagion; in fact this paper must henceforth be considered as classical evidence, if truthful.

Hereditary transmission is shown by the histories furnished to have been an unusual cause, and also that sequestration and isolation acted as a perfect prophylactic. Translation of the whole paper, though it would doubtless be interesting, would occupy too much space.

DURATION OF INCUBATION AND CONTAGIOUSNESS.

Clinical Society of London, Eng. (*Lancet*, Jan. 26, 1889). The clinical society under this heading asks for well-authenticated reports from any source which shall throw light upon the periods of incubation and contagiousness of the subjoined diseases, viz., variola, varicella, German measles, scarlet fever, typhus, relapsing fever, whooping cough, diphtheria, enteric fever, cholera, erysipelas, mumps, and infectious sore throat. Messrs. Shirley Murphy, 41 Queen Anne Street, and Dr. Dawson Williams, 25 Old Burlington Street, W., are among the honorary secretaries, whose addresses are annexed and to whom communications may be forwarded.

COMMUNICATION ON CHROMIDROSIS.

Dr. Arthur Wynne Foote, Royal Academy of Medicine, Ireland, at meeting of Dec. 14, 1888 (*Lancet*, Feb. 6, 1889, p. 333). The writer presented a most interesting paper on this most rare and interesting condition in the human subject. He states that since the case recorded by Dr. Jonge, of Plymouth, England, in 1709, there are up to the present time forty-six admittedly genuine cases on record—six in men, forty in women.

His analysis of probable or hypothetical causes is highly scientific and interesting.

It will be noted that an "International Congress of Dermatology and Syphilography" will take place under the authorization and auspices of the Direction of the "Exposition Universelle Internationale of 1889."

Ricord and Hardy, Presidents; most if not all the better known dermatologists and syphilographers of France are associated in the committees.

The honorary secretaries are as usual taken from all nations. Dr. P. A. Morrow is appointed to represent the U. S. A. in this capacity. The Congress will have its seat at the Hôpital St. Louis for six days, August 5th to 10th inclusive.

The questions to be discussed during the respective days will be the following :

First Day.—On the constitution of the lichen group.

Second Day.—On pityriasis rubra, and on primary generalized exfoliating dermatitis.

Third Day.—On pemphigus, and on bullous dermatoses, complex or multiform.

Fourth Day.—On the trichophyton, and its manifestations.

Fifth Day.—General direction and duration of treatment of syphilis.

Sixth Day.—Relative frequency of tertiary syphilis. Conditions most favorable to its development.¹

¹ Papers are asked for on all questions of interest relating to dermatology, but it would seem desirous if they can be read, or at most debated, in the time given; the orders of the day would seem from their far-reaching character to exclude all hope of this. They will make probably interesting reading as appendixes doubtless to the printed transactions.

In regard to the subject having the place of honor on the first day, the lichen group. It may be said that a great deal of good writing, doubtless the best on the subject, has hitherto been done by American dermatologists, among whom may be quoted Robinson, Fox and Taylor. At a recent discussion of the subject in the late Washington meeting, a very decided unanimity was found present among the authors and speakers on that occasion. The summaries of papers, etc., will be found in Transactions of the American Dermatological Association for 1888. S. S.

DISEASES OF CHILDREN.

BY JEROME WALKER, M.D.

THE BABIES' HOSPITAL—A SUMMER'S WORK.

Sarah J. McNutt, M.D. (Medical Record, March 2, 1889), after referring to the generally received opinion that bottle feeding of infants in hot weather in city institutions is equal almost to a sentence of death, and after citing from a recent report from the infant hospital at Randall's Island, that but *one* bottle-fed baby admitted within the last eighteen months had reached the age of one year, the Doctor points with pardonable pride to the results obtained at the temporary home

at 61 East 36th Street, New York, between June 16, 1888, and January 1, 1889. The house is an ordinary one, wedged in between others and *in a crowded portion of the city*. Of the 108 babies (all sick) received, 28 were over one year of age; 79 under one year; 53 under six months; 34 under three months; and 15 under one month; 32 died, all under one year of age and all sick with gastro-intestinal troubles; 22 died in July, August and September. Of the 108 babies admitted, 101 had gastro-intestinal troubles. In regard to the results Dr. McNutt says: "Although that experience covers as yet only one summer, it seems to us to demonstrate that bottle feeding is not necessarily fatal even in a hospital, and that a hospital for sick babies need not be a place for the production of autopsies alone." She shows by inference that the *quality* of bottle feeding has much to do with infant mortality, and that in addition to proper feeding, proper care is essential. In the experiment hygienic measures were considered of more importance than drugs.

Cleanliness and air.—House was fumigated every two weeks with burning sulphur. Daily the water closets and bath tub, after thorough washing, were disinfected with sulphate of zinc, four ounces; salt, two ounces; water, one gallon. Once a week waste pipes were flushed with hot lye, one-quarter pound of lye to one gallon of water. Soiled articles removed at once and disinfected with zinc solution; hammocks in open air on back porch for some babies and carriages for others were freely used.

Food.—Thin barley, oatmeal and crown wheat food gruel, white of egg, half ounce added to one ounce of gruel; Rudisch's sarcopeptones and beef peptonoids, half to one drachm to two or three ounces of gruel; wine whey, half to one ounce to one or four ounces of gruel; cream, half to one drachm at each feeding. Sterilized milk was used as soon as it could be, beginning with one-sixth. All gruels and other food as far as possible were kept in air-tight bottles, each bottle holding enough for one meal. After thorough rinsing, each bottle was filled with a solution of soda bicarb. Milk was sterilized by Soxhlet process, enough to last twenty-four hours. Corks and wool were found to be better than the red rubber stoppers. When sterilized milk alone was not well borne then such milk was pancreatized. If no milk could be used then Mellin's food, Carnrick's imperial granum, and malted milk were used, but milk was more often serviceable.

Sometimes enemata were resorted to; every four hours half ounce peptonized milk or with half drachm or one drachm of sarcopeptones; stimulants if necessary. If rectum was irritable, astringent, one or two hours before time for enema, with one or two drops of deodorated tincture of opium. Generally just before enema was given bowel was flushed with warm water.

Baths and Massage.—All children were bathed twice daily, a quick sponge bath, water with temperature of 95° F. to 105° F., generally, never less than 60° F. Massage and inunction: cod liver oil, four ounces; alcohol, one ounce, were valuable.

Lavage.—If persistent gastric catarrh and indigestion, once a day, twenty minutes before feeding. A tube a little larger than No. 9 catheter was used, with funnel. Had to be used with care. Some children very much prostrated by its use; needed stimulants to revive them.

Medicinal Treatment.—As antiseptics or as aids to digestion, pancreaticin, resorcin, creolin, etc., were tried, after there had been a free evacuation of the bowels. Of these drugs creolin seemed to answer best. When colic did not yield to hot applications, generally did to doses of "Baby Mixture," *i. e.*, half grain soda bicarb.; five drops spirits chloroform; ten drops glycerine; aquæ, three drachms in two drachms of warm water. Wakefulness generally quieted by doses of tincture hyoscyamus or tincture lavender compound, *i. e.*, two to five drops in baby mixture; accumulation of gas by tincture assafoetida or half drop doses tincture capsicum in the baby mixture. [This method of adding medicines as necessary to a standard quieting draught has been most serviceable to us.]

It will be noticed that the cost of maintenance in the Babies' Hospital of each patient per week was *four* dollars, a larger amount than most institutions care to acknowledge to the public. But Dr. McNutt deprecates the false economy in the management of most institutions for children which is so prevalent, when she says: "A word should be added in regard to the nursing in our hospital. We do not expect a single nurse to take care of a whole wardful of sick babies. The nurses are especially trained in the hospital for this work, with an average of one nurse to every four patients during the day and one to every eight patients during the night. Further we do not try to reduce our expenses to the lowest possible cost, but relying upon the liberality of our patrons, put the patient's welfare ahead of every other consideration."

DYSPEPSIA AS REFLECTED IN THE MUCOUS MEMBRANE OF THE UPPER AIR-PASSAGES.

Beverly Robinson, M.D. (New York Medical Journal, April 20, 1889). "Let the stomach be disturbed acutely or in a chronic manner by an attack of acute dyspepsia or habitual indigestion and immediately there is evident morbid response on the part of the pituitary, pharyngeal, or laryngeal mucous membrane." . . . "The pharyngeal inflammation is ordinarily one of two distinct types. Either

there is a markedly red swollen aspect with sensations of dryness, soreness, and pain in deglutition; or there is less of these symptoms, while the tonsils on the other side show a considerable number already of white exudations, situated over or near the mouths of the follicles, and which, as far as I have been able to observe, differ in no respect from similar deposits that indicate a contagious disorder with which we are all familiar." "Frequently the nasal passages become more or less occluded from swelling and infiltration of the turbinated bodies and the mucous membrane lining the naso-pharynx." "Now, although I believe that a not dissimilar state may occur from 'catching cold,' yet I am of the opinion that the digestive organs and particularly the stomach are, as a rule, directly responsible for these effects, always admitting that a check of perspiration, or sitting in a draught, or getting a wetting may in a sensitive child produce acute indigestion even though there has been no evident error in diet."

The writer finds reason for the belief in the dyspeptic cause of the disturbance in the upper air-passages, from the fact that active purgation and low diet for several days generally relieves the inflammation. He states also that chronic ailments of these parts are not infrequently due to chronic dyspepsia, especially in children, the result of the excessive use of sugar and sweets, etc.

OBSERVATIONS ON THE USUAL METHODS EMPLOYED FOR MODIFYING THE ALBUMINOIDS OF MILK IN INFANT FEEDING.

T. M. Rotch, M.D., Asst. Prof. Dis. of Chil., Harvard Med. School (Boston Med. and Surg. Jour., Feb. 7, 1889). The writer points to the generally accepted idea by physicians that the curd in cows' milk is made more digestible by addition to the milk of alkalies, etc., and has experimented with these and with cracker crumbs, Mellin's Food, Imperial Granum, Robinson's Barley, and other articles. These experiments he refers to somewhat at length, and ends with, "We may conclude that until something more definite is known concerning this rather theoretical method of treating the albuminoids of milk, *that dilution with plain water is the most practical and efficient means at our command.*" The italics are ours. The conclusion which Dr. Rotch reaches is opposed to the teaching of the more recent authorities.

THE TRAINING OF NURSES FOR SICK CHILDREN.

C. L. W. (in the Trained Nurse, March, 1889). This article is worth the reading. The author starts with two propositions—1st, that sick children may require special nursing, and 2d, that such children's

nurses require special training. It is shown how children and their ailments differ from adults and their ailments, and in order to understand children a love for them and a special study of them are necessary. Physicians know how impossible it is sometimes to obtain the results desired with sick children simply because the mothers or nurses do not know how to deal with them. Fond, indulgent mothers, and a goodly number of the ordinary trained nurses, are poor nurses for children. Speaking of what is too often expected of children, the writer says: "Order and discipline there must be, or the children will not be happy; but the ward that is tidied up to perfection, in which the little ones look like well-drilled soldiers, when the home look of liberty is absent and nothing is out of place, is hardly suggestive of the happy heart of a child." We may add that where such a state of things exists, recovery from sickness is delayed.

ACETANILIDE IN CONVULSIONS.

Dr. I. N. Love (Medical Age, Jan. 25, 1889). "In acetanilide I am sure we have a most valuable remedy for the relief and prevention of convulsions. Clinical experience for one year justifies the conclusion. The action of the drug is rapid, usually beginning to manifest itself within an hour and not infrequently within twenty minutes. Its full effect was reached in four hours.

SCARLATINIFORM RASHES.

Jos. Grindon, M.D. (The Journal of the American Medical Association, April 27, 1889). The writer, though stating that his paper is not original, has grouped and compared the rashes which may be mistaken for scarlatinal ones. The information gained from this paper is of especial value to the physicians having charge of institutions for children, or located in hotels having many guests. In such places the suspicion of scarlatina causes alarm, and injustice by the unnecessary forced removal of inmates as is sometimes the case.

The writer shows that the early roseola of syphilis, especially when attended by throat complications and syphilitic fever, may be mistaken for scarlatina; and shows the similarity, as to the eruption and some of the symptoms, between scarlatina proper and scarlatina puerperalis, some cases of diphtheria associated with eruptions, certain cases of pityriasis rubra or dermatitis exfoliatum in their early stages, and cases of "dermatitis medicamentosa" caused by belladonna or atropia, chloral hydrate, mercury, opium, and morphine, quinine, oil of turpentine, etc.

THE TREATMENT OF DIPHThERIA IN CHILDREN BY STEAM MEDICATED WITH
SULPHUROUS ACID.

T. Wyld Pairman, L.R.C.P. and S. Ed. (Te Awamutu, Auckland, N. Z. Edinburgh Med. Jour., Feb., 1889). My invariable practice now, when called to a case of diphtheria, is to erect a tent over the head of the sufferer by fixing to the bed an open umbrella and throwing over this a large sheet. I then procure six feet or so of zinc spouting, which can be readily detached from the dwelling-house. Punch a hole in its length and fit the mouth of an ordinary kettle into it. One end is tilted up and placed under the tent, the bed being situated at right angles to the fender; and if the kettle contain water at no higher level than the inner spout-hole, steam will at once proceed up the pipe into the tent. With this steam treatment I usually combine mild antiseptic fumes, obtained by burning sulphur 3 i in the apartment every hour."

The steam is continuously kept up, and patient is given as much beef-tea, milk, etc., as can be taken. The writer does not speak of using stimulants. The advantages claimed for this treatment are: 1st, constitutional and local rest, patient not being annoyed by medication or swabbings; 2d, that the steam acts as a poultice and softens deposit, while sulphur destroys it and prevents its spread; 3d, that after such treatment paralysis seems never to occur; 4th, that patients seldom complain of sore throat, and are able to swallow with little or no difficulty; 5th, that vital powers are not much weakened. Certainly an admirable group of results.

An objection made sometimes to the continuous use of steam is the high temperature which ordinarily has to be maintained in the room in order to accumulate steam enough. If steam can be conveniently and thoroughly used under a tent such as is proposed, and sulphur atomized without overheating the room, well and good. Prolonged and excessive high temperature of the room, together with a greatly diminished supply of oxygen and an accumulation of carbonic acid, are largely responsible, in our judgment, for the death of some diphtheritic patients by weakening of the heart. The ordinary steam atomizers in use have too small reservoirs for liquid, and are liable to get out of order if taxed to their utmost. The slaking of lime, the production of steam by heated bricks, etc., are laborious processes, and at times destructive of furniture. What is needed is a strong, light, effective steam producer and atomizer, with pipes or tubes of varying lengths and angles, and which can be used with an alcohol lamp, oil or gas stove, and which can be used effectively in a well-ventilated room.

NOTES ON THE TREATMENT OF ENURESIS NOCTURNA.

Simon Baruch (in D. Archives of Pediatrics, April, 1889). By the twentieth month of life the writer claims that most children can be taught the uses of a vessel and the necessity of systematic emptying of the bladder, and deprecates the punishment of children because they wet their beds. In the New York Juvenile Asylum, with which he is connected and which has cared for about *one thousand* children between six and fourteen years of age, about ten per cent. were bed-wetters. The wet-bed wards contain eighty beds, each mattress covered with a rubber, and over this is a blanket. The beds are in rows, and the worst cases are placed in the rows nearest the water-closet. Each child empties the bladder before retiring and once or twice in the night, being roused by the nurse or watchman. Punishment and lying upon triangular blocks of wood has been found to be of little avail. Rewards, especially transferring on good behavior from the beds of the worst bed-wetters (nearest the closets) to the furthest rows or into other rooms has done more good.

The causes generally assigned for enuresis, viz., general debility, acid urine, adherent prepuce, constipation, ascarides, lithates in the urine, etc., he has not found in private practice, and is in doubt as to them in public practice. He has tried as remedies, tr. ferri mur., syr. ferri iodidi, tr. nucis vom., tr. belladonnæ as ordinarily used, chloral, blisters to nuchæ, cold spongings, friction, local faradization, and anthelmintics, but has had very poor results. Circumcision he has not tried, because he has found case after case of nocturnal enuresis in circumcised boys and in many girls; though in the Hebrew Orphan Asylum, with 540 inmates, about one per cent. are bed-wetters. In the Boston Children's Hospital the number is twenty-one and one-half per cent.

The remedy which has given the writer the best success has been belladonna used in sufficient quantity to paralyze the detrusor muscle of the bladder; atropia given at 4 P.M. and at bedtime, *i. e.*, 7 P.M., in sufficient quantity to dilate the pupil— $\frac{1}{34}$ to $\frac{1}{65}$ gr. to children from six to ten years of age, and double the amount for children from ten to fourteen years. The second dose is not given if the first dose dilates the pupil. Under this treatment of children who had been in the wet-bed ward from three months to three years, five wet the bed once, seven twice, five three times, four four times, one six times, one seven times, one eight times, two nine times, and twenty-nine not once, after receiving the first dose, and as long as the remedy was continued.

SURGERY.

BY GEORGE R. FOWLER, M. D.,

Surgeon to St. Mary's Hospital, and to the Methodist Episcopal Hospital.

STRANGULATED CONGENITAL INGUINAL HERNIA : LAPAROTOMY.

Kirmesson. (*Gaz. des Hôpitaux*, 1888, No. 49).

In strangulated congenital hernia, where the obstruction is situated very high, at the internal inguinal ring, K. advises not to make "incisions in the dark," but to reach the site of the obstruction by dividing all the overlying soft parts. He calls this procedure "laparotomie laterale." After failing in three cases of patients with such hernias, K. made trial of this method. A fourth patient, whose history is related, was saved by the lateral laparotomy. After replacing the hernia, K. first sutured the abdominal wound by three deep sutures, comprising its entire thickness. Then the peritonæum situated in the hernial opening was ligated and extirpated, the hernial sac being sutured and dressed antiseptically. K. declares the prognosis of these hernias to be especially unfavorable; first, because the surrounding ring is very light; second, because the strangulation is situated very high in the inguinal canal; third, because usually a great number of loops of jejunum are strangulated. He hopes to procure a better prognosis, in these hernias, by his procedure.

A FREQUENT CAUSE OF THE GROWTH OF GALL-STONES IN FEMALES.

F. Marchand. (*Deutsche Med. Wochenschrift*, 1888, No. 12).

The principal etiological fact accounting for the frequent occurrence of gall-stones in females, is to be found, M. argues, in lacing, which causes a compression of the gall bladder, and especially of the ductus cysticus. The stagnation of the contents of the former thereby caused induces the formation of sediments, from which the larger gall-stones are developed. A slight pressure suffices to cause this pathological process, for frequently the growth of gall-stones is observed in persons of sedentary habits, because of the gall ducts being compressed by the bow of the ribs. M. calls attention to the fact that the discharge of the bile is prevented in the day-time by the bodice, that being the time when the discharge occurs most freely; in the night time, the digestion being suspended, the mouth of the ductus cysticus is closed by muscular contraction, so that the stagnation of the bile, after the removal of the bodice, still continues.

Finally, M. notes that, in those cases where carcinoma of the gall bladder was found, stones were always present, and he finds an etiological relation between these stones and the carcinoma.

SUTURING BLOOD-VESSELS.

v. Horoch. (*Allgemeine Wiener med. Zeitschrift*, 1888, Nos. 22 & 23).

H.'s experiments prove that, by the suture of arteries as well as by the ligature, the arteries subsequently show complete obstruction by coagulation, the complete obstruction of the arterial tube occurring much more quickly by ligature than by suture. Further, by suturing, the sutured portion of the artery only is excluded by the thrombus from the circulation. H. did not succeed in performing arterial suture with catgut, therefore he prefers silk. He claims that this method is indicated in such cases where large arteries are injured, and where ligating would unfavorably influence the circulation.

In three attempts of suturing of large venous trunks the continuity of the vessel remained, and the interior was more or less free. Therefore this method must be preferred to the lateral ligature, as Blasius demonstrated, that, by the latter, the tube of the vein is closed by a thrombus.

A CASE OF HERNIA IN THE LUMBAR REGION.

Dr. Karl Bayer, Prague. (*Centralblatt für Chirurgie*, Vol. xv, No. 37, pp. 686-88).

P. Lesshafti called a special lumbar region the "*trigonum lumbale superius seu Rhombus lumbalis*." This region is bounded laterally by the external oblique muscle, above by the lower edge of the serratus posticus inferior muscle and the point of the 12th rib, toward the median line by the external edge of the sheath of the extensor dorsalis muscle, and below by the internal oblique muscle. He discriminates this region from the trigonum of Petit, and points to the fact, that it is the thinnest point of the abdominal wall within the lumbar region; by its anatomical relations it is especially liable to be the seat of hernia.

Bayer reports the first case of hernia in this region. April 14th, 1888, a girl of six years was brought into Franz Joseph Hospital, at Prague, with a tumor in the right lumbar region, discovered by her mother a few days before. At the age of three and a half years the child suffered from a fever, which lasted two months, and was followed by a tumor the size of a fist, in the right lumbar region. This tumor was opened in a Vienna clinic and healed after suppurating for fourteen days.

After careful examination B. made the diagnosis of *hernia lumbalis*, whose contents were principally bowel, involving, however, a portion of the right kidney. He recommended a truss consisting of a broad elastic belt with a soft pad the size of a small palm. On the 21st of July, B. saw the child again, and, after removing the truss, noticed a

small depression instead of the former protrusion, the latter being visible only in case of coughing; and while before he could easily press the end of his finger into the depression, between the serratus posticus inferior and internal oblique muscles one and one-half ctm. below the inferior edge of the 11th rib, he could not easily do it now. This fact agrees with the observation of others, (Braun, Wolf) that the openings of lumbar hernias, probably because of their shortness, can be closed gradually by the prolonged wearing of a truss. This is the 31st of a series of undoubted cases of lumbar hernia, and the first reported in the above described region.

UPON A CAUSE OF DEATH AFTER LAPAROTOMY WITH EVENTRATION OF THE
INTESTINES NOT HERETOFORE RECOGNIZED.

Olhausen. [*Zeitschrift f. Geburtshilfe und Gynäkologie*. Bd. xiv., p. 619.]

It frequently happens after laparotomy that collapse occurs after several days without peritonitic symptoms, and death follows. Usually collapse occurs on the second or third day, rarely directly after the operation. The symptoms are weak, frequent pulse; sensorium free; subjective opinion of being well; meteorism in a high degree; tenderness on pressure; frequent vomiting; no passage of gas or fecal matter. Death occurs from the fourth to the tenth day. Autopsy discloses no indications of peritonitis or sepsis. In the stomach are found enormous quantities of fluid; bowel marked with ecchymosis and paralyzed. The author believes that the intestines remaining out of the abdominal cavity for some time during the operation may induce changes in the circulation of the intestinal walls which causes venous obstruction, serous transudation and finally the formation of ecchymosis. At the same time a paralysis of the muscles of the bowel occurs, which may last for days and induce the appearances of ileus. The paralysis probably causes death by favoring the resorption of the decomposed contents of the bowels.

A PROPOSITION FOR OPENING THE BLADDER FROM THE SYMPHYSIS PUBIS.

W. Koch. (*Berliner klin. Wochenschrift*, 1888, No. 20).

A cross incision is made reaching to the bone, one side of which is formed by the symphysis, the other being perpendicular to the symphysis and somewhat below its middle. The connections of the ligamentum arcuatum with the arch of the symphysis are then loosened and all the soft parts of the anterior surface of the descending portion of the os pubis to the foramen obturatum are pushed aside. Chisel from the neighborhood of the symphysis, while preserving the periosteum

and perichondrium of its posterior surface, a square of bone from $4\frac{1}{2}$ to 5 cm., and there will remain from the two horizontal portions of the os pubis, which join at the symphysis, a bridge from 2 to $2\frac{1}{2}$ cm., and also a bony bridge at the anterior edge of the foramen obturatum, which probably will be sufficient to afford the necessary support to the symphysis. After smoothing the edges of the bone, the periosteum and perichondrium are to be pushed toward the overlying peritoneal folds to the anterior surface of the bladder, in order to prevent a subsequent intestinal hernia between the bladder and the remainder of the symphysis. The penis now being pressed downwards, the connective tissue together with the venous plexus, at the anterior surface of the bladder, can be easily pushed aside, when the anterior wall of the bladder, from the overlying peritoneal folds to the urethra, is to be cut through.

In performing this operation upon patients, the opening of the bladder is to be postponed until after the granulation of the wound. K. thinks this operation is indicated in cases of severe catarrh of the bladder, hypertrophy of the prostate with retention of urine, when it is difficult to pass a catheter through the urethra, and cases of tumors of the bladder favorably situated. The methods now in use are sufficient for removal of stone in the bladder. K. does not raise claims of priority over Langenbuch.

A METHOD OF OPENING THE ANTRUM OF HIGHMORE.

Ziem. (Therapeut. Monatshefte, 1888, April and March, pp. 148 and 222). Z. found the most useful instrument for opening the cavity of the antrum to be the so-called American boring machine or surgical engine used by dentists. The instrument usually employed is a drill of one and a quarter millimetres; larger ones can be used. Z. prefers to enter from the intermediate space between the second bicuspid and first molar tooth, or between the two bicuspid teeth. Z. claims that the opening of the antrum with this instrument is easy and safe, even in cases of uncertain diagnosis, where an exploratory puncture is to be made. He also claims that this method is less dangerous, easier and more certain than the method of Mikulicz's, of operating from the nose.

SURGICAL TREATMENT OF ABSCESS OF THE LIVER.

L. Defontaine (Gaz. des hôpitaux, No. 58). Complicated abscesses of the liver generally cannot be operated upon; simple abscesses can usually be treated successfully by an operation if recognized early. The latter is found idiopathically or secondarily after dysentery and other ulcerations of the bowels; in cases of gall-stones causing inflam-

mation around the small stones in the gall-ducts, or after the rupture of a gall-duct obstructed by a stone, and in cases of pyæmia, which latter usually produces many small abscesses. The large abscesses of the liver are usually situated in the right lobe.

The diagnosis is to be based on the following points: pains in the right hypochondriac region, radiating to the right shoulder; remittent fever, and occasionally jaundice; general debility, and loss of flesh.

D. recommends the following method of treatment: When the abscess can be reached from the abdomen below the last rib, it is to be located by exploratory puncture and a little pus removed. Then an incision is made of eight to ten ctm., if possible in the direction of the greatest diameter of the tumor, or parallel to the edge of the ribs, cutting through to the peritonæum. Arrest hæmorrhage while cutting through the peritonæum. The pus is to be removed by aspiration, and the liver is then to be secured to the parietal peritonæum; and finally a broad incision of the abscess is made, drainage tubes placed, and the wound antiseptically dressed.

When the abscess cannot be reached from below, the operation is to be performed within the chest, after resection of one or more ribs. After opening the parietal and diaphragmatic pleura, Thornton advises to first suture both folds, and then incise the abscess through the diaphragm. The after-treatment is the same as in the previously mentioned method. Recovery takes place usually in from four to six weeks.

SPRAINS OF THE ELBOW-JOINT OCCURRING IN ENFORCED ABDUCTION WITH
RUPTURE OF THE INTERNAL LATERAL LIGAMENT.

P. Poirier (*Progrès méd.* T. VII., 1888, No. 6). P. describes the ligamentous apparatus of the ulnar side of the elbow-joint, basing his description upon anatomical researches, as consisting of three bundles, to be separated anatomically and functionally: 1. the anterior portion put upon the stretch with the extension of the joint is the thinnest and only strengthens the anterior ligament; 2. the posterior portion which is put upon the stretch with the flexion of the forearm; 3. the middle portion which is the strongest, and prevents radial abduction of the forearm. The latter functionally is the proper lateral ligament of the joint. P. found by experiments that, radial abduction being forced by experiment or injury, the middle portion only was injured; the forearm being fixed, the ulnar insertion was injured, and the upper arm being fixed the humeral insertion was injured.

An important point to be decided is as to whether the distortion by radial abduction has caused only a stretching, or a tearing off of the ligament. The former yields quickly to massage; the latter has often to be treated as a fracture, and repair takes place slowly.

UPON SPIRAL FRACTURES.

Kröll (Deutsche Zeitschrift f. Chirurgie, Bd. xxviii., p. 1-60). Kröll gathers his descriptions from an exhaustive study of the old classical works and museum specimens, and the data for his own observations from a report of eighty-four cases, mostly verbal, and a large number of original experiments. The majority of the observations refer to the hollow bones of the lower extremities.

Two varieties are distinguished, that which takes the form of a right, and that following the direction of a left screw, the former only being known as the corkscrew fracture. The most frequent cause of the origin of a spiral fracture is torsion of the bone upon its long axis—a screw-shaped twisting of the same in either direction. Experiments on the cadaver showed that the spiral fracture followed a direction opposite to the torsion force employed. Besides these there is another kind of spiral fracture, depending upon the normal tendency to spiral growth of all the bones of the skeleton. These are longitudinal fractures, the course of which follows the typical direction of the bone itself. As the bones of the right side have a left spiral tendency, and *vice versa*, the cause of this tendency to spiral fracture is evident. These latter present a longer spiral than those produced by the application of a twisting force—torsion fracture.

The prognosis in spiral fracture is much more grave than those occurring in an oblique or transverse direction. This arises from the presence of pointed fragments, which penetrate the soft parts, splintering or splitting of the bones, with rents communicating with the adjoining joint cavities, and extensive destruction of the marrow. The formation of peculiar rhomboid fragments is one of the characteristics of this fracture. Accordingly the course of the case is frequently complicated by suppuration, osteomyelitis, gangrene, etc., and the result often far from satisfactory.

UPON THE SURGICAL TREATMENT OF PERFORATION OF THE STOMACH AND INTESTINES FOLLOWING ULCERATION.

Steinthal of Heidelberg. (Archiv für Klinische Chirurgie, Bd. 37, Heft 4).

Steinthal gives as indications for the performance of the operation of laparotomy, the sudden occurrence of severe pain referable to the abdominal region, accompanied by greater or less collapse, in individuals in whom a history pointing to ambulatory typhoid, typhilitis or perityphilitis is obtained, and particularly if these symptoms have followed an act of vomiting or other powerful exertion or straining effort. To these are added the objective signs of peritonitis, which develop much more quickly after a perforation than in cases of obstruction or occlusion of the bowel, and if free gas is found in the abdominal cavity (peritoneal meteorism), the diagnosis between perforation and

acute diffuse peritonitis is comparatively easy. The latter is distinguished by the absence of every motion of the intestinal canal usually recognized through the abdominal walls by the sight, feeling and hearing, and likewise of the hepatic dulness, and when a doughy condition of the epigastrium with a well marked and generally high percussion note is distinguished

Czerny attempted to lay down rules in guiding the surgeon to a conclusion regarding the location of a perforation. Odorless gas with slight septic qualities, upon opening the peritonæum, indicates stomach perforation. Steintal adds to this, rapid disappearance of the line of dulness and almost constant absence of vomiting. In cases of perforation of the ileum, gas of septic odor and qualities appears; in perforation of the jejunum, slight exit of the intestinal contents and gradual appearance of the symptoms occur.

Up to the present time twenty-three cases of laparotomy for ulcerative perforation have been reported, of which number ten have recovered. In the fatal cases it has not been found that the operation itself has lessened the patient's chances of recovery, or that circumscribed has been connected with general peritonitis, as has been until now the generally expressed fear on the part of medical practitioners.

As to the technique of the operation, in cases of circumscribed peritonitis following perforation near the surface, the peritoneal contents are evacuated by incision; and if the place of perforation is accessible, the same should be at once closed by sutures, avoiding as much as possible further manipulation, and leaving further procedure for the future. If the perforation is not localized and the peritonitis general, the peritoneal cavity should be freely opened, in order to get a clear view. If the perforation be supposed to be in the cæcum, a lateral incision is recommended; in perforation of the stomach and duodenum, an incision in the linea alba from the umbilicus upwards, with perhaps the addition of a cross-incision; in the case of the jejunum and ileum, a long incision in the median line. The peritonæum should be opened at first by a small incision, in order to confirm or amend the diagnosis by the escaping gas. It may happen that the bowel loops, despite the perforation, are still much distended, and their return into the abdominal cavity is attended with some difficulty. We succeed rather easily in overcoming this difficulty by Kümmel's method, with antiseptic compresses.

He recommends, after the manner of Mikulicz, flooding the abdominal cavity, after closing the perforation, with a one-sixth of one per cent. solution of salycilic acid, and drying the loops of intestine and all available parts with tupper wrung out of 1.200 sublimate solution. Drainage is recommended by means of iodoform wicking, after Gersuny's plan.

NEW BOOKS AND BOOK NOTICES.

PROCEEDINGS OF THE NEW YORK PATHOLOGICAL SOCIETY FOR THE YEAR 1888.

This is, we believe, the fifth volume which the N. Y. Pathological Society has issued under the various titles of Transactions, Bulletins, and Proceedings.

The present volume of 170 pages is supplemented by J. M. DaCosta's Middleton Goldsmith lecture on "The Relation of Diseases of the Kidneys, especially the Bright's Diseases, to Diseases of the Heart," and biographical sketch of the late Middleton Goldsmith, M.D., LL.D., by John C. Peters, M.D., who we believe, is the editor of the Proceedings.

We fear that the usefulness of the volume as a book of reference is impaired by prefixing the index to the supplements. Who would think of looking in the middle of a book for the index? Though the book is as full of good things as an egg is of meat, those of us who do not get time to read books *seriatim* will overlook some of the best things in one which has apparently neither table of contents nor index.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, vol. ii., Nos. 1 & 2.
8vo, paper. Wm. Wood & Co., N. Y. City, April and May, 1889.

The contents of the April volume is an article on "Diabetes and Its Connection with Heart Disease," by Jaques Mayer, M.D., and one on "Blenorrhœa of the Sexual Organs and Its Complications," by Dr. Ernest Finger, Docent at the University of Vienna.

Dr. Mayer's monograph on "Diabetes" is based upon the study of 380 cases, which he has observed from 1879 to 1888. His experience at Carlsbad and Vienna has been large, and his conclusions are consequently valuable.

Dr. Finger, in his monograph on "Blenorrhœa," speaks only of the virulent process whose virus is the gonococcus, and therefore recognizes only one condition as necessary to the production of blenorrhagic urethritis, viz., the conveyance of gonococci. His diagnosis of gonorrhœal discharge depends directly upon the demonstration of gonococci in the pus or muco-pus. He gives full directions for the microscopical examination of the discharges and the recognition of the specific microbe. The disease and its complications in both sexes are handled in a masterly way, and the monograph will prove interesting to all of us who meet this oftentimes most troublesome of diseases.

The May number contains a monograph on "The Preventive Treatment of Calculus Disease and the Use of Solvent Remedies," by Sir Henry Thompson, F.R.C.S., etc., and one on "Sprains, their Consequences and Treatment," by C. W. Mansell Moullin, M.D., etc.

Sir Henry Thompson's world-wide reputation is enough to stamp the three lectures in the brief monograph by him as a valuable contribution to the subject. We do not learn, however, that there is any chance of solvent remedies, for the present at least, taking the place of lithotrity.

The second monograph, on "Sprains and their Consequences," is an important one, if it does no more than call our attention to the gravity of the injury, for we all know that few accidents are generally treated with so little consideration; and there are probably few injuries which if neglected are more far-reaching in their consequences.

MANUAL OF INSTRUCTION IN THE PRINCIPLES OF PROMPT AID TO THE INJURED. Designed for Military and Civil Use. By Alvah H. Doty, M.D., Major and Surgeon, 9th Reg't, N. G. S. N. Y., Attending Surgeon to Bellevue Hospital Dispensary, New York. 8vo, cloth, illustrated. D. Appleton & Co., 1889.

To quote from the preface: "The object of this manual is to instruct those who are desirous of knowing what course to pursue in emergencies, in order that sick or injured may be temporarily relieved. Special effort has been made to give laymen in ambulance service, etc., instructions which will enable them to cope with emergencies without encouraging them to usurp the functions of the physician or surgeon."

The first seven chapters are devoted to giving a brief scheme of anatomy and physiology, liberally illustrated, so as to teach by pictures what the non-professional attendant might not otherwise understand.

The remaining twelve chapters are devoted to the emergent consideration of such subjects as bandaging, antiseptics and deodorants, wounds, hæmorrhage, unconsciousness, shock and syncope, asphyxia and drowning, poisons, convulsions of children, etc.

The book is very neatly gotten up, the covers decorated with the Swiss cross, and very fully illustrated.

MERCK'S INDEX OF FINE CHEMICALS AND DRUGS FOR THE MATERIA MEDICA AND THE ARTS. Comprising a summary of whatever chemical products are to-day adjudged as being useful in either medicine or technology, with average values and synonyms affixed. By E. Merck, of New York, Darmstadt, and London.

This volume is essentially the catalogue and price-list of that exceedingly well-known and extensive line of chemicals which Merck's Darmstadt Chemical Works has been turning out for two hundred and twenty-one years, the house having been founded by Jacob Frederick Merck in the year 1668.

We have no doubt but that the book will prove a welcome visitor to every one fortunate enough to receive a copy.

WARNER'S THERAPEUTIC REFERENCE BOOK.

This little book, put out by the well-known firm of sugar-coated pill and parvule manufacturers of Philadelphia, contains much in the way of ready reference tables of the usual visiting-list style, besides formulas for all sorts of diseases.

KANSAS MEDICAL JOURNAL.

Topeka, Kansas, has been in labor and has brought forth a healthy-looking offspring, which has been named *Kansas Medical Journal*, and is fathered by Drs. W. I. Schenck, of Osage City, with J. E. Minney and S. G. Stewart, of Topeka.

We have no doubt but that the result will justify the pains. We grasp the proffered hand and bid our new confrère God-speed.

JOURNAL OF THE RESPIRATORY ORGANS.

Of making medical journals there is no end. The present year has given birth to several new journals, among which we observe the *Journal of the Respiratory Organs*, emanating from our brothers across the Bridge. J. Mount Bleyer is the editor, and it is published by Napoleon Thompson, 33-43 Gold Street, New York City.

THE TIMES AND REGISTER.

While we constantly recognize new faces (or rather covers) on our exchange table, we also frequently miss those we have learned to respect and frequently consult.

Our Philadelphia friends have greatly improved on the old plan, for instead of allowing three influential journals to go out of existence they have united the *Philadelphia Medical Times*, the *Medical Register*, and the *Dietetic Gazette* under the title *The Times and Register*. We would have liked the title better had they, like our Topeka brethren, left off the in this case useless article *the*, which is an annoyance to those who adhere strictly to the alphabetical in cataloguing. We have seen catalogues with whole pages under the letter *T*, describing *the Journal, the Times*, etc.

The new publication will be weekly, with a quarterly number devoted to physiological medicine. It is claimed that the new American Medical Press Association will be strictly independent, and not an organ of any society, college, city or firm.

We have no doubt but that in this union there will be found strength.

ELECTRICITY IN MEDICINE AND SURGERY.

F. A. Davis, of Philadelphia, has in press a new work on the "Practical Application of Electricity in Medicine and Surgery," by Dr. G. A. Liebig, of Johns Hopkins University, and Prof George H. Rohé, of the College of Physicians and Surgeons of Baltimore.

The part on "Physical Electricity," written by Dr. Liebig, one of the recognized authorities on the science in the United States, will treat fully such topics of interest as Storage Batteries, Dynamos, the Electric Light, and the Principles and Practice of Electrical Measurement in their relations to Medical Practice.

Prof. Rohé, who writes on "Electro-therapeutics," discusses at length the recent developments of electricity in the treatment of stricture, enlarged prostate, uterine fibroids, pelvic cellulitis, and other diseases of the male and female genito-urinary organs.

The applications of electricity in dermatology, as well as in the diseases of the nervous system, are also fully considered.

The work will be fully illustrated by engravings and original diagrams.

MISCELLANEOUS.

BROOKLYN VITAL STATISTICS FOR APRIL, 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Population, estimated April 1, 1889.....	821,525	The number of Births reported was ..	1096
In the month of April there were	1517	The number of Marriages reported was ..	375
deaths, the rate of mortality being 22.46 per 1000 of population.		The number of Still-births reported was ..	114

The mortality by classes and by certain of the more important diseases was as follows :

Causes :

1. Zymotic	324	Malarial Diseases	18
2. Constitutional	295	Diarrhoeal Diseases (all ages).....	21
3. Local.	750	“ “ (under 5 years) ..	13
4. Developmental	117	Phthisis	187
5. Violence.....	31	Bronchitis	98
Measles	43	Pneumonia.	197
Croup ..	43	All Respiratory.....	314
Diphtheria.....	100	Bright's Diseases	39
Scarlet Fever.....	46	Puerperal Diseases.....	9
Typhoid Fever.....	2	Old Age.....	34
Whooping Cough.....	19	Suicide	6

Reported Cases :

Diphtheria	252	Measles.....	729
Scarlet Fever.....	475	Typhoid Fever.....	9

Deaths by sex, color, and social condition were as follows :

Male.....	814	Foreign	454
Female.....	703	Married.....	376
White	1488	Single	940
Colored.....	29	Widows, Widowers, and not stated.....	201
Native	1063		

Still-births, excluded from list of deaths, were as follows :

Males	60	} Total.....	114
Females ..	54		
Deaths in public institutions.....	104	Homicides	0
Deaths in tenement houses ..	699	Suicides.....	6
Inquest cases	107		

Age periods :

Deaths under 1 year.....	325	Total deaths 5 to 20	149
Deaths under 5 years.....	336	“ “ 20 to 40.....	248
Total deaths under 5 years.....	661	“ “ 40 to 60.....	236
		“ “ 60 and upwards.....	223

Certain foreign and American cities show the following death-rates for the month of April, 1889 :

Brooklyn	22.46	Vienna	26.97
New York.....	28.47	Paris	24.40
Philadelphia	20.13	London.....	17.57
Berlin.....	23.20	Glasgow.....	29.62
Dublin.....			26.80

BROOKLYN VITAL STATISTICS FOR MAY, 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Population, estimated April, 1889, 821,525	The number of Births reported was.....	1299
In the month of May there were 1525 Deaths, the rate of mortality being 21.86 per 1000 of population.	The number of Marriages reported was.....	548
	The number of Still-births reported was.....	127

The Mortality, by classes and by certain of the more important diseases, was as follows:

Causes:

1. Zymotic.....	289	Malarial Diseases.....	9
2. Constitutional.....	303	Diarrhoeal Diseases (all ages)....	26
3. Local.....	768	“ “ (under 5 years).....	19
4. Developmental.....	126	Phthisis.....	188
5. Violence.....	39	Bronchitis.....	74
Measles.....	25	Pneumonia.....	180
Croup.....	30	All Respiratory.....	287
Diphtheria.....	97	Bright's Diseases.....	39
Scarlet Fever.....	38	Puerperal Diseases.....	10
Typhoid Fever.....	5	Old Age.....	29
Whooping Cough.....	28	Suicide.....	7

Reported Cases:

Diphtheria.....	236	Measles.....	447
Scarlet Fever.....	364	Typhoid Fever.....	12

Deaths, by sex, color, and social condition, were as follows:

Male.....	755	Foreign.....	481
Female.....	770	Married.....	402
White.....	1521	Single.....	927
Colored.....	24	Widows, Widowers and not stated..	196
Native.....	1044		

Still-births, excluded from list of deaths, were as follows:

Males.....	67	} Total.....	127
Females.....	60		

Deaths in public institutions.....	124	Homicides.....	2
Deaths in tenement houses.....	768	Suicides.....	7
Inquest cases.....			131

Age Periods:

Deaths under 1 year.....	348	Total deaths, 5 to 20.....	125
“ “ 5 years.....	300	“ “ 20 to 40.....	284
Total deaths under 5.....	648	“ “ 40 to 60.....	244
		“ “ 60 and upwards.....	224

Certain foreign and American cities show the following death-rates for the month of May, 1889:

Brooklyn.....	21.86	Vienna.....	26.82
New York.....	24.37	Paris.....	22.78
Philadelphia.....	20.25	London.....	16.70
Berlin.....	23.68	Glasgow.....	27.90
Dublin.....			26.30

BROOKLYN VITAL STATISTICS FOR JULY, 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Population, estimated July 1, 1889..834,607	The number of Births reported was	1287
In the month of July there were 1954	The number of marriages reported was	424
Deaths, the rate of mortality being 27.56 per 1000 of population.	The number of Still-births reported was	114

The mortality by classes and by certain of the more important diseases were as follows:

Causes;

1. Zymotic.....	788	Malarial Diseases.....	19
2. Constitutional.....	338	Diarrhoeal Diseases (all ages).....	617
3. Local.....	648	“ “ (under 5 years).....	557
4. Development.....	125	Phthisis.....	174
5. Violence.....	55	Bronchitis.....	35
Measles.....	4	Pneumonia.....	60
Croup.....	29	All Respiratory.....	110
Diphtheria.....	54	Bright's Diseases.....	42
Scarlet Fever.....	10	Puerperal Diseases.....	13
Typhoid Fever.....	15	Old Age.....	31
Whooping Cough.....	25	Suicide.....	7

Reported Cases;

Diphtheria.....	149	Measles.....	53
Scarlet Fever.....	83	Typhoid Fever.....	30

Deaths by sex, color, and social condition, were as follows:

Male.....	1049	Foreign.....	446
Female.....	905	Married.....	379
White.....	1922	Single.....	1386
Colored.....	32	Widows, Widowers, and not stated..	189

Still-births, excluded from list of deaths, were as follows:

Males.....	60	} Total.....	114
Females.....	54		
Deaths in public institutions.....	131	Suicides.....	7
Deaths in tenement houses.....	946	Inquest cases.....	158

Age Periods:

Deaths under 1 year.....	855	Total deaths, 5 to 20.....	95
“ “ 5 years.....	273	“ “ 20 to 40.....	258
Total deaths under 5 years.....	1128	“ “ 40 to 60.....	238
		“ “ 60 and upwards.....	235

Certain foreign and American cities show the following death-rate for the month of July:

Brooklyn.....	27.56	Vienna.....	23.74
New York.....	33.14	Paris.....	20.97
Philadelphia.....	23.31	London.....	16.40
Berlin.....	38.70	Glasgow.....	23.05
Dublin.....			20.25

HUNTING YELLOW FEVER GERMS.

BY GEORGE M. STERNBERG, M.D., SURGEON U. S. A.

An Address delivered by special invitation before the Quarantine Conference, at Montgomery, Ala., March 5, 1889.

GENTLEMEN: It would have been far more satisfactory to you and to me if the subject of my address this evening could have been announced as "The Yellow Fever Germ." I need hardly say that nothing would have given me greater pleasure than, in the presence of the experts in the clinical and prophylactic management of yellow fever here assembled, to exhibit microscopic preparations and pure cultures of the specific infectious agent which I have been so long in search of. I shall show you presently upon the screen photo-micrographs of a variety of micro-organisms which I have encountered in the course of my researches, some of which are hitherto undescribed species, and among them some which have specially engaged my attention as possible yellow fever germs. I shall also show you cultures and photo-micrographs of the micrococcus presented to me by Dr. Domingos Freire, of Brazil, as his microbe of yellow fever; of the tetragenus febris flavæ of Dr. Carlos Finlay, of Havana; and of the bacillus of Dr. Paul Gibier, of Paris.

But I must announce to you, in advance, that there is no satisfactory evidence that any one of these micro-organisms is the veritable infectious agent in the disease under consideration.

I at first hesitated to accept the invitation extended to me to address you on this occasion, inasmuch as my investigations have not yet led to any definite result, and as they are still in progress and will be continued in Havana during the present summer. But the importance of the occasion and the solicitation of my good friend Dr. Cochran, the efficient Health Officer of the State of Alabama, have induced me to come here for the purpose of making a brief statement relating to the present status of the investigation with which I am charged, and especially for the purpose of demonstrating to you the methods of research employed by bacteriologists in investigations of this nature.

I may say before going any further, that my faith in a living infectious agent as the specific cause of this disease is by no means diminished by my failure thus far to demonstrate the exact form and nature of this hypothetical "germ." The present state of knowledge with reference to the etiology of infectious diseases in general, and well-known facts relating to the origin and spread of yellow fever epidem-

ics, fully justify such a belief. The *a priori* grounds for such faith I stated as long ago as 1873, in a paper published in the *American Journal of the Medical Sciences* (July, 1873); and the progress of knowledge since that date has all been in the direction of supporting this *a priori* reasoning. But yellow fever is by no means the only infectious disease in which satisfactory evidence of the existence of a living infectious agent is still wanting. In the eruptive fevers generally no demonstration has been made of the specific etiological agent—at least none which has been accepted by competent pathologists and bacteriologists. Again, in the infectious disease of cattle known as pleuro-pneumonia, notwithstanding very extended researches by competent investigators in various parts of the world, no satisfactory demonstration of the germ has been made. The same is true of hydrophobia, in which disease we are able to say with confidence the infectious agent is present in the brain and spinal cord of animals which succumb to rabies; this infectious agent is destroyed by a temperature which is fatal to known pathogenic micro-organisms (65° C.), and by various germicide agents, yet all efforts to cultivate it or to demonstrate its presence in the infectious material by staining processes and microscopical examination have thus far been unsuccessful.

You are aware that my first effort to solve the etiology of yellow fever was made ten years ago. As a member of the Havana Yellow Fever Commission of the National Board of Health, I had an opportunity to make researches which, in advance of the effort, I fondly hoped might lead to demonstration alike creditable to American science and useful as a basis for preventive and curative measures in this pestilential malady, which has destroyed the lives of so many of our fellow-citizens, and has so largely interfered with the material progress of certain sections of the United States. I knew, from personal experience, the malignant nature of the disease, and the futility of the various modes of treatment which had been resorted to in the effort to combat it. It was, therefore, with the deepest interest as well as with strong hopes of success, that I went to an endemic focus of the disease to search for the yellow fever germ. The recent (1873) demonstration of the spirillum of relapsing fever in the blood of patients suffering from this disease, and the recognized facts relating to the etiology of anthrax, considered in connection with the current notions relating to the pathology of yellow fever, led me to hope that the discovery would prove an easy one. I was familiar with the most approved methods of mounting and staining micro-organisms, and was provided with the best high-power objectives that could be procured, the one-twelfth and one-eighteenth homogeneous oil immersion objectives of Karl Zeiss, of Jena, Germany. Not only did I feel that I was equipped for the

recognition of any micro-organism which might prove to be present in the blood, but I was prepared to photograph it, and thus to show to others what I might see in blood drawn from the circulation of yellow fever patients. You know the result of this investigation; "ninety-eight specimens from forty-one undoubted cases of yellow fever were carefully studied, and one hundred and five photographic negatives were made, which showed satisfactorily everything demonstrable by the microscope." But no micro-organism was discovered. I shall presently show you upon the screen a photo-micrograph of yellow fever blood, made in Havana at the time mentioned, so that you may judge of the performance of my Zeiss one-eighteenth inch objective, and have ocular evidence that no micro-organism demonstrable by this magnificent lens was present in it. I may say here that my culture experiments, made in Havana last spring, in which blood taken from one of the cavities of the heart, as soon as possible after death, was introduced into various nutritive media, gave a like negative result.

Out of ten cases in which I made autopsies, in the military hospital at Havana, a development of micro-organisms occurred in two only. In the exceptional cases I obtained a bacillus which subsequent researches showed to be identical with a bacillus constantly found in the alimentary canal of healthy persons—the *bacterium coli commune* of Escherich.

The absence of micro-organisms from blood drawn from the finger during life, or from the heart after death, cannot, however, be accepted as evidence that there are no parasitic organisms anywhere in the tissues. The bacillus of typhoid fever, for example, is rarely found in the circulating fluid, although it must be transported in the blood current to the various organs in which foci of growth are found which contain numerous bacilli. Such foci are especially abundant in the spleen, but even in this organ many thin sections made be made before a single focus of development is encountered.

Having failed to find the yellow fever germ in the blood, we may still admit that, as in typhoid, it is perhaps only to be found in the organs principally involved in the morbid process. This reasoning has led me to give special attention to an examination of the liver and kidney, both by the culture method and by the examination of thin sections. Both methods have given me positive results, so far as the occasional presence of micro-organisms is concerned, but both are in accord in failing to demonstrate the constant presence of any particular organism. In my culture experiments, made in Havana last year, the micro-organism most frequently encountered was my bacillus α , already referred to as found in two out of ten cases in cultures from

blood drawn from the heart. Naturally, I have given much attention to this bacillus, and it was only after an extended series of comparative experiments that I gave up the hope that it might be concerned in the etiology of the disease under consideration. These comparative experiments forced me to the conclusion that this is the same bacillus as was found by Emmerich in cholera cadavers at Naples, and that it corresponds with the *bacterium coli commune* of Escherich.

In my researches by the method of staining thin sections of the tissues hardened in alcohol, I have encountered several different micro-organisms; but no one of these has been found in a series of cases. One, the bacillus of Lacerda and Babes, I have found only in material brought from Dr. Lacerda's laboratory in Brazil, and in two only out of nine cases represented by material from this source. In one of my Havana cases, in which the material was collected by my friend, Dr. Burgess, in 1887, a long bacillus was found in the kidney, for the most part in the glomeruli. In a case in which I made the autopsy in Havana last spring a micrococcus, grouped in fours, was found in the kidney.

Evidently, if any one of these micro-organisms was found in a considerable series of cases, the fact would be decidedly significant, and would afford presumptive evidence that the parasitic organism found bore some relation to the morbid process. But, even if one and the same micro-organism was found in every case, the final proof of its etiological import would depend upon its isolation in pure cultures, and the production of the characteristic phenomena of the disease in one of the lower animals, or, in the absence of a susceptible animal, in man himself.

The method of cultivation is by far the most reliable for the demonstration of micro-organisms which will grow in our culture media, for isolated cocci or bacilli might easily escape observation when present in small numbers, but would serve to start a culture. Thus the bacillus of typhoid fever, which, as stated, is not as a rule found in the spleen in scattered clumps, may be obtained from this organ in pure cultures, almost without fail, by introducing a small quantity of splenic pulp into a suitable nutritive medium.

Moreover, this method enables us to differentiate micro-organisms which look alike, and which by microscopic examination alone it would be impossible to distinguish one from another. This is a fact now well recognized by bacteriologists, but not generally appreciated by microscopists whose researches have been limited to the staining and mounting of sections.

Both methods require skill and practice in the execution and great caution in drawing conclusions, for there are a thousand traps lying

in wait for the explorer, in this field of investigation. It is for this reason that pseudo-discoveries are so numerous.

Especial care is required in the microscopical examination of stained preparations of yellow fever tissues. One encounters in the urinary tubules, mingled with the débris of the desquamated epithelium, stained masses of various forms which often closely resemble cocci or bacilli. These I believe to be fragments of nuclear material. The same material is often massed in the urinary tubules in the form of plugs, which are deeply stained by the aniline dyes.

Again, fragmentation of the nuclei of cells still in position may give the impression of a cell containing cocci; and the karyokinetic figures found in the cells, especially in the liver, often resemble bacilli so closely that it is difficult to convince any one not familiar with them that they are not micro-organisms.

The "plasma cells" of Ehrlich, also, seem to have as their chief function the *role* of deluding amateur microscopists into the idea that they have made a discovery. They are often very abundant in the liver and in the kidney of yellow fever cases, and so closely resemble zoöglæa masses of micrococci that experienced pathologists have been deceived by them.

In addition to these objects which resemble micro-organisms there are dangers from the post-mortem invasion of the tissues when the autopsy has been delayed beyond an hour or two, in the warm climates where yellow fever prevails; or even in the preserving medium, or during the process of staining.

My experiments made in 1883 showed that "exposure to ninety-five per cent. alcohol for forty-eight hours did not kill the bacteria in broken-down beef tea (old stock)," and pathologists are familiar with the picture presented by the post-mortem invasion of tissues which have been left in alcohol which was not strong enough to preserve them.

Finally, inasmuch as my culture experiments with material collected soon after death, from the liver and kidney, gave a positive result in a certain proportion of the cases, it is evident that the micro-organism most frequently found by this method—my bacillus *a*—should occasionally be encountered in stained preparations.

The possibility remains that by some method of staining not hitherto employed, the specific infectious agent may yet be demonstrated in the tissues; but the fact that my culture experiments with material from the liver and kidney of ten cases failed to demonstrate any such specific microbe is opposed to this view. We may, of course, suppose that the yellow fever germ not only requires special methods, yet undiscovered, for its demonstration in the tissues, but that it will

not grow in the culture media which I have employed in my researches. I would say in reply to this hypothesis that all known pathogenic micro-organisms may be demonstrated by the staining methods employed, and that, inasmuch as the yellow fever germ appears to find a favorable nidus in the filth beds external to the body, I have been inclined to believe that, like the bacillus of typhoid fever and cholera, it is not especially nice as to the character of the medium in which it may develop. However, this may be a mistaken idea, and I propose in my future researches to make use of various culture media not yet employed, and especially to make cultures from the tissues and the excreta in an atmosphere from which oxygen has been excluded; for it may be that, like the bacillus of malignant œdema and the bacillus of tetanus, the yellow fever microbe is anaerobic.

While, then, I admit that by some special method of staining, or by a modification of the culture methods heretofore employed, the specific infectious agent we are in search of may yet be found in the tissues of yellow fever patients, I feel justified in saying that no such demonstration has yet been made. The negative results attending my researches in this direction have led me to turn my attention to the micro-organisms present in the alimentary canal, for the possibility suggests itself that this may be after all the habitat of the deadly yellow fever microbe, which is capable of destroying life within two or three days, and that the phenomena of the disease are not directly due to its presence in the body, but result from the absorption of a poisonous ptomaine produced by it, as appears to be the case in cholera.

The famous English hygienist, Parkes, from the consideration of evidence relating to the prevalence of yellow fever during a series of years among English troops stationed in Jamaica and elsewhere within the "yellow fever zone," in connection with the sanitary condition of their barracks, arrived at the conclusion that yellow fever is a "fecal disease," and there are many facts relating to the origin and extension of epidemics which seem to support this view—that is, the belief that the germ finds a proper nidus in fecal matter external to the body. If in yellow fever, as in cholera, the infectious agent is located in the alimentary canal of those who fall sick with the disease we can readily understand how it is that new centres of infection are developed, when external conditions are favorable, in the localities where imported cases have occurred, or as a result of the introduction to such localities of fomites.

This view also accords with the demonstrated fact that yellow fever is not directly communicated by the sick to those in attendance upon them. Pathogenic germs which multiply in the intestine no more endanger those who are associated with the infected individual than

the same microorganisms cultivated in a suitable medium in a test tube endanger the bacteriologist who is engaged in their study.

The possibility that the infectious agent in yellow fever may have its habitat in the alimentary canal, occurred to me several years ago, and I determined, in advance of my visit to Havana last spring, to give special attention to a bacteriological study of the intestinal contents.

It is well known that the excreta of healthy persons contain a vast number of microorganisms of various species, and that while some of these appear to be constant, others are occasional, and, we may say, accidental tenants of the human intestine, being introduced, no doubt, with the ingesta, and especially in drinking water.

Notwithstanding the researches of Brieger, of Bienstock, of Escherich, of Vignal, and others, this bacterial flora of the healthy intestine is still imperfectly known. The attempt, therefore, to explore this field for the purpose of finding a specific microbe in any particular disease, is attended with very great difficulties, unless, as in cholera, this specific microbe occupies the field to the exclusion of the ordinary bacteria found in the intestinal contents. Koch found his "comma-bacillus" almost in pure cultures in the characteristic rice-water discharges of cholera patients, and other bacteriologists, following his methods, have had no difficulty in verifying the presence of the same microorganism in cases of cholera occurring in various parts of the world. On the other hand, extended comparative researches, including my own investigations made in Havana and in Decatur, show that the "comma-bacillus," or rather spirillum, is not found in the alvine discharges of healthy persons, or in other diseases than cholera. If in yellow fever, as in cholera, there was a microorganism in pure cultures, or in relatively great abundance, capable of growing in the culture media which are suitable for the development of a majority of the known pathogenic organisms, I ought to be able, to-night, to exhibit to you cultures and photo-micrographs of this microorganism. But my researches show that the microorganism which is by far the most abundant and, so far as my investigations go, the only constant form found in the excreta of yellow fever cases, is the *bacterium coli commune* of Escherich, which is also the most constant and abundant form found in the excreta of healthy persons.

In Havana my cultures were made from material from the stomach and intestine of fatal cases obtained at time of making the autopsy. My researches did not show that any of the microorganisms encountered was constantly present, with the exception of the *bacterium coli commune*—my bacillus *a*. Having excluded this bacillus by comparative researches, there was nothing to point to any one of the microorganisms present in my cultures as the probable infectious agent I was in search of.

The bacillus of Dr. Paul Gibier I only encountered in three cases out of ten, and in these it was not present in very great abundance, compared with the colon-bacillus for example.

My time in Havana, limited by my orders, was too brief to enable me to make an exhaustive research. The epidemic in Florida and Alabama during the past summer gave me an opportunity to continue the investigation, and, at my request, I was directed to proceed to the infected district for this purpose. The presence of my friend Dr. Jerome Cochran, State Health Officer at Decatur, decided me to locate my laboratory in that place, where I found abundant material for the researches I had in view. Having made a considerable number of autopsies in Havana, I determined while in Decatur to devote my attention especially to a bacteriological study of the alvine discharges collected during the different stages of the disease.

Evidently, if the infectious agent multiplies in the intestine, it should be found in the excreta during the earlier stages of the attack.

The cause must be present in advance of the development of the morbid phenomena which characterize the disease. But it is quite possible that during its later stages the etiological agent has perished, and, therefore, would not appear in cultures made from material obtained post-mortem.

While in Decatur, and after my return to Baltimore, I examined by bacteriological methods—Esmarch tubes—the excreta of 39 cases of yellow fever, and for comparison of 9 convalescents and of 19 healthy individuals. A detailed account of the results reached will be given in my final report. As was to have been expected, I have encountered a variety of micro-organisms. Many of these I have isolated in pure cultures, and the biological and pathogenic characters of several have been carefully studied by cultivation in various media and by inoculation experiments in the lower animals. It would be premature for me to attempt to give you the results of these researches, even if time permitted me to do so. But I may repeat what I said at the outset, that the germ of yellow fever has not yet been demonstrated. It is possible, however, that one or the other of the micro-organisms which I have isolated is the long-sought germ, although I have no satisfactory evidence upon which to base a claim that this is the case.

My attention has been especially directed to the liquefying organisms found in the excreta of the 39 cases examined. In a majority of these cases the presence of liquefying bacilli was demonstrated; but liquefying colonies were not numerous as compared with the non-liquefying, among which the colon-bacillus of Escherich was by far the most abundant. In a series of Esmarch tubes, No. 1 would show

numerous liquefying centres, usually within twenty-four hours, very often No. 2 would contain a few liquefying colonies, while, as a rule, No. 3, although containing numerous isolated colonies of the colon-bacillus, did not contain any liquefying colonies. Further, I found that several different liquefying organisms were present in different cases, or were associated in the same case. I shall presently show you cultures and photo-micrographs of these liquefying bacilli. The one most frequently present, my bacillus *o*, I have since found in cultures from another source, and am obliged to exclude it as the possible specific etiological agent of yellow fever. It has also been isolated by Dr. Booker, of Baltimore, from the discharges of one or more infants suffering from summer diarrhoea. The bacillus of Gibier I have only isolated from three cases, and in these it was not present in considerable numbers. I have made extensive experiments upon the lower animals, which show that this bacillus has interesting pathogenic properties, but give no special support to the view that it is the specific germ of yellow fever. I have never observed in my cultures the black pigment which, according to Gibier, is produced during the development of this bacillus, and am at a loss to understand this discrepancy in our observations.

So far as the pigment in black vomit is concerned, I have no doubt that it is of hæmic origin. I have never failed to demonstrate, by a microscopic examination, the abundant presence of red blood-corpuscles in the numerous specimens of black vomit which I have examined. The little black flocculi are, in fact, made up of agglomerated corpuscles which have lost their pigment and appear as pale disks, often more or less swollen and distorted; while the brownish pigment, which has been changed by the acid secretions of the stomach, remains in their vicinity in the form of granules or amorphous masses. The idea that there is something specific about this pigment, or that it is the secretion of a specific microbe, as has been maintained by Freire and Gibier, appears to me to be untenable. In the majority of the non-fatal cases of yellow fever, and in a certain proportion of the fatal cases there is no passive hæmorrhage into the stomach, and consequently no black vomit; yet these cases must result from the action of the same etiological agent as those in which this symptom is present.

I have found by experiment that the bacillus of Gibier, the micrococcus of Freire, and the tetragenus of Finlay, all grow after being exposed for an hour to a temperature of -15°C . (5°F). Exposure outside of the laboratory in Baltimore for five days in the month of January failed also to destroy the vitality of these micro-organisms, although the temperature during the greater part of the time at least, was below the freezing-point.

Having thus given you a brief account of the present status of the investigation in which I am engaged, I propose to devote the remainder of the time at my disposal to a practical demonstration of the methods of research employed, and to an exhibition upon the screen of the various microorganisms to which I have referred.— *The Medical News*.

FORWARD DISLOCATION OF THE LEFT ULNA.

BY J. S. WIGHT, M.D.,

Prof. Operative and Clinical Surgery at the Long Island College Hospital.

Reprint from the Transactions of the Medical Society of the State of New York, 1889.

On the 16th of January, 1887, Mr. P——, a laborer, about fifty years of age, while sitting on an office stool, that was nearly three feet in height, fell to the floor and struck on his left elbow. In the afternoon of the following day I saw him with Dr. Ford and Dr. Welty, who were in attendance. The following facts were noted: The internal condyle and the trochlea were easily felt from behind under the skin and fascia, and their outline could even be seen. The olecranon and the base of the ulna were absent from their normal place, the head of the radius was in its normal relation with the external condyle; the radius was not dislocated. The olecranon and the base of the ulna could be distinctly made out in front of the lower end of the humerus.

The coronoid process of the ulna and the sigmoid notch of the olecranon could be traced under the soft parts in front of the elbow. And when the forearm was moved, the coronoid process and the olecranon also moved in their abnormal position, as they could be distinctly felt. The forearm could be adducted to a very considerable extent. Flexion of the forearm was mostly absent. The upper and inner side of the forearm was abnormally prominent. And rotation of the forearm was very much impaired.

It was thus evident, that the upper end of the left ulna had been dislocated, and that it was in front of the internal condyle and the trochlea. That the dislocating force had been applied to the outer and posterior aspect of the upper end of the ulna, and that the olecranon had been driven inward, forward, and outward, around the internal condyle, so as to leave it in front of the lower end of the humerus, is shown by the facts above enumerated, and is corroborated by the steps taken in the reduction. In this place one fact deserves mention: The internal humeral condyles of this patient were less

prominent than the average. It is evident that the injury above described would be more apt to take place if the patient had a small internal condyle.

The steps of the reduction were as follows : The patient was on his back in bed, the limb being carried somewhat away from his side. The left forearm was firmly supinated and then abducted well toward a right angle with the arm. This manœuvre liberated the upper end of the ulna, which was moved inward and downward, the head of the radius being applied to the external condyle, that acted as a fulcrum. The olecranon was then carried backward by forcibly pronating the forearm, so as to make the radius press on the ulna. This brought the greater sigmoid notch in such a position as to cause it to embrace the internal condyle and the trochlea. Then the forearm was flexed, and at the same time the upper end of the ulna was pushed downward and inward, when the dislocated bone was reduced to its normal place ; and when the forearm was extended the unusual deformity had disappeared. The points of reduction were these : Abduction carried the olecranon inward and downward ; supination lifted the upper end of the ulna out of its abnormal position ; pronation then carried the ulna backward ; and pressure, accompanied by flexion and extension, moved the ulna downward and inward to its normal position.

The injured limb was put on a right angled splint, and the forearm was supported by a sling. Some inflammatory swelling appeared about the injured joint. Passive motion was made at the end of a week. The splint was kept on a few days longer. Then the patient was advised to begin some voluntary motion of the forearm. He carried the forearm in the sling for nearly three weeks, when he had considerable use of the injured limb. Finally, there was some disability left after five or six months had elapsed from the time of the accident.

SEVENTH DECENNIAL CONVENTION FOR REVISING THE
PHARMACOPŒIA OF THE UNITED STATES
OF AMERICA.

Notice is hereby given that, in accordance with and by virtue of the authority vested in me by the Convention of 1880, I hereby call upon the several incorporated medical societies, incorporated medical colleges, incorporated colleges of pharmacy, and incorporated pharmaceutical societies throughout the United States of America, The American Medical Association, and The American Pharmaceutical Associ-

ation, to elect a number of delegates, not exceeding *three*, and upon the Surgeon-General of the Army, Surgeon-General of the Navy, and the Surgeon-General of the Marine Hospital Service to appoint, each, not exceeding *three* medical officers to attend a General Convention for the revision and publication of the Pharmacopœia of the United States of America, to assemble in the city of Washington, D. C., on the first Wednesday of May, 1890 (May 7th) at twelve o'clock noon.

The several bodies, as well as the medical departments of the army, navy, and marine hospital service, are hereby requested to submit the Pharmacopœia to a careful revision, and to transmit the result of their labors to the Committee of Revision at least three months before the meeting of the General Convention.

The several medical and pharmaceutical bodies are hereby requested to transmit to me, as the President of the Convention of 1880, the names and residences of their respective delegates, as soon as they shall have been appointed; a list of these delegates shall thereupon be published under my authority, for the information of the medical public, in the newspapers and medical journals in the month of March, 1890.

In the event of the death, resignation, or inability of the President of the Convention of 1880 to act, these duties (in accordance with the resolution of that convention) shall devolve, successively, in the following order of precedence: upon the Vice-Presidents, the Secretary, the Asst. Secretary, and the Chairman of the Committee of Revision and Publication of the Pharmacopœia.

The officers are as follows: First Vice-President, Samuel C. Busey, M.D., of Washington, D. C.; Second Vice-President, P. W. Bedford, Ph.G., of New York; Secretary, Frederick A. Castle, M.D., of New York; Assistant Secretary, C. H. A. Kleinschmidt, M.D., of Washington, D. C.; Chairman of Committee of Revision, Charles Rice, Ph.D., of New York; First Vice-Chairman of the Committee of Revision, Joseph P. Remington, Ph.M., of Philadelphia, Pa.; Second Vice-Chairman of the Committee of Revision, C. Lewis Diehl, Ph.D., of Louisville, Ky.

At the General Convention held in Washington, D. C., on the fifth day of May, 1880, the organizations and bodies enumerated in the Abstract of the Proceedings of the National Convention of 1880, on pp. xv. to xviii. of the U. S. Pharmacopœia of 1882—a list of which will be found appended to this call—were recognized as being entitled to representation.

If any body other than those admitted in 1880 shall desire a representation in the Convention of 1890, it is suggested that the proof of incorporation, signed by the Secretary of State of the State which shall

have issued the charter, or by properly qualified public officials of the United States, be presented with the credentials of the delegation.

A blank form of certificate of appointment of delegates will be sent upon application by letter to my address, care of Dr. Edwin H. Brigham, Assistant Librarian of the Boston Medical Library, 19 Boylston Place, Boston, Mass.

(Signed) ROBERT AMORY,
President of the Convention of 1880.

BOSTON, March 9th, 1889.

LIST OF INCORPORATED BODIES AND OF GOVERNMENT DEPARTMENTS REPRESENTED IN THE PHARMACOPEIAL CONVENTION OF 1880.

Connecticut Medical Society, Iowa State Medical Society, Massachusetts Medical Society, Medical Society of the State of New York, Medical Society of the State of North Carolina.

College of Physicians and Surgeons in the City of New York; College of Physicians, Philadelphia; Medical and Chirurgical Faculty of Maryland; Medical Society of the District of Columbia; New York Academy of Medicine; Philadelphia County Medical Society.

Albany Medical College, Med. Dep. of Union University, Albany, N. Y.; Bellevue Hospital Medical College, New York; College of Medicine, Syracuse University, Syracuse, N. Y.; College of Physicians and Surgeons, Med. Dep. of Columbia College, New York; Dartmouth Medical College, Hanover, N. H.; Department of Medicine and Surgery of the University of Michigan, Ann Arbor. Jefferson Medical College, Philadelphia, Pa.; Medical College of Indiana, Med. Dep. of Butler University, Irvington, Ind.; Medical Department of Howard University, Washington, D. C.; Medical Department of Iowa State University, Iowa City; Medical Department of the University of Georgetown, Washington, D. C.; Medical Department of the University of Maryland, Baltimore; Medical Department of the University of Pennsylvania, Philadelphia, Pa.; Medical Department of the University of Virginia, Charlottesville, Va.; Miami Medical College, Cincinnati, O.; Missouri Medical College, St. Louis; National Medical College, Med. Dep. of Columbian University, Washington, D. C.; Rush Medical College, Chicago, Ill.; University of the City of New York, Med. Dep., New York; Woman's Medical College of the New York Infirmary, New York; Women's Medical College of Pennsylvania, Philadelphia, Pa.

Chicago College of Pharmacy, Chicago, Ill.; Cincinnati College of Pharmacy, Cincinnati, Ohio; College of Pharmacy of the City of New York, N. Y.; Louisville College of Pharmacy, Louisville, Ky.; Maryland College of Pharmacy, Baltimore, Md.; Massachusetts College of Pharmacy, Boston, Mass.; National College of Pharmacy, Washington, D. C.; Pennsylvania College of Pharmacy, Philadelphia, Pa.;

Philadelphia College of Pharmacy, Philadelphia, Pa.; St. Louis College of Pharmacy, St. Louis, Mo.; University of Michigan, School of Pharmacy, Ann Arbor, Mich.

Medical Department of the U. S. Army; Medical Department of the U. S. Navy; U. S. Marine Hospital Service.

A PREGNANT CAUSE OF FAILURE IN VACCINATION.

Dr. Stephen C. Martin writes as follows to the *Boston Medical and Surgical Journal* :

MR. EDITOR :—Some time ago—I cannot now fix its date, and its author's name I have forgotten—an article appeared in a medical journal severely deprecating the ordinary method of performing the slight operation of vaccination as unscientific and dangerous in the extreme, because offering a free and hearty welcome to the hordes of ravening germs that are everywhere constantly on the watch for a chance of ingress to the human body. It then proceeded to lay down certain sapient rules to be followed, that all such dangers might surely be avoided and the operation taken from the realms of malpraxis and placed upon a scientific basis. One was directed to most thoroughly wash the arm of the vaccinee, the instrument to be used, and his own hands with a solution of carbolic acid. This article was quite freely copied in the medical press of the country, and similar counsel has likewise appeared from time to time, merely substituting for the carbolic acid, corrosive sublimate, that being the latest favorite among germicides. When such advice is thus freely published and, what is worse, followed, it is high time that a decided protest be entered. For advice that makes pretence of being ultra-scientific, none could well be more grossly unscientific and absurd. Do those who give it or follow it reflect for a moment on what they are trying to accomplish by vaccination—that the introduction of pathogenic germs into the system is precisely the end aimed at by that procedure? Let them do so, and then calmly consider the propriety of saturating the soil in which these germs are to be sown, and everything coming in contact with them, with the most powerful and perfect fluid germicide science has produced. The satisfaction of having performed a thoroughly antiseptic operation may thus be attained, and the wound will heal admirably, but there will be no *vaccination*.

Far be it from me to say one word detracting from the most thorough *asepsis* in connection with vaccination. Thorough cleanliness should be observed and a foul lancet most carefully guarded against.

All this can be perfectly accomplished by observing the following simple directions: Wash the arm thoroughly with plain soap and water, hold your lancet, if you use one, for a moment in a flame, which will as thoroughly sterilize it as an ocean of corrosive sublimate or carbolic acid solution could, and when the lancet has become cool, simply vaccinate your subject; but in the name of all that is rational, do not use a drop of any fluid germicide as an adjunct. Then, if you have not chosen a hot-bed of infectious diseases for the scene of the vaccination and have used proper virus upon a decently healthy subject, you will have the consciousness of having taken every essential precaution, and, what is perhaps of *some* importance, infected your patient with cow-pox, your sole motive for having to do with him at all.



A JUDGE'S OPINION ON THE USE OF THE TITLE HOMŒOPATHIST.

Judge George C. Barrett, of the Supreme Court of this city, sends to the *New York Medical Times* an opinion which will be read with much interest. He was asked to give a reply to the question, "Has a physician designating himself an 'Homœopathist' and called as such to a patient, any legal or moral right to adopt other than homœopathic means in the treatment of the case?" To this Judge Barrett answers: "I have your note of the 11th inst, asking my opinion upon a question of professional ethics. In my judgment there can be but one answer to your question, and that is in the negative. If I call in a medical man who designates himself a 'homœopathic physician,' it is because I do not wish to be treated allopathically, or eclectically, or otherwise than homœopathically. There is an implied understanding between myself and the homœopathist that I shall receive the treatment which, by tradition and a general consensus of opinion, means small doses of a single drug administered upon the principle of *similia similibus curantur*. If there is to be any variation from that method, I have a right to be informed of it and to be given an opportunity to decide. Common honesty demands that before a confiding patient is to be drugged with quinine, iron, morphine, or other medicaments, either

singly or in combination, he should be told that the 'homœopathist' has failed, and that relief can only be afforded by a change of system. An honest 'homœopath,' who has not succeeded, after doing his best with the appropriate homœopathic remedies administered on homœopathic principles, should undoubtedly try anything else which he believes may save or relieve his patient. But when he reaches that point the duty of taking the patient into his confidence becomes imperative. The patient may refuse to submit to the other system or he may agree, but prefer a physician whose life has been specially devoted to practice under that other system. He may say to the 'homœopathist:' You have failed, but I prefer to try another gentleman of your own school before resorting to a system that I have long since turned my back upon. Or he may say, Well, if homœopathy cannot save me, I prefer to go to headquarters for allopathic treatment. All this, gentlemen, is the logical sequence of the particular designation 'Homœopathist.' "



AN ACT TO PROVIDE FOR THE PRELIMINARY EDUCATION OF MEDICAL STUDENTS.

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1. Before the regents of the university of the State of New York or the trustees of any medical school or college within this state shall confer the degree of doctor of medicine on any person, who has not received a baccalaureate degree in course from a college or university duly authorized to confer the same, they shall require him to file with the secretary or recording officer of their university or college a certificate showing that, prior to entering upon the prescribed three years study of medicine, he passed an examination conducted under the authority and in accordance with the rules of the regents of the university of the State of New York, in arithmetic, grammar, geography, orthography, American history, English composition and the elements of natural philosophy, and such certificate shall be signed by the secretary of the regents and countersigned by the principal or commissioner conducting said examination.

§ 2. This act shall not apply to persons who have already entered upon the prescribed three years study of medicine, nor shall it alter the time of study or the courses of medical instruction required to be pursued in the medical colleges of this state by existing statutes.

§ 3. This act shall take effect immediately.

SULFONAL FOR NIGHT-SWEATS.

Although the number of remedies recommended for night-sweats is very large, it may not be amiss to give some information regarding a new cure: Sulfonal, the soporific recently so warmly recommended. Bättrich's attention was first attracted to the subject by the case of a lady eighty years old, to whom he had administered only one-quarter gram as a soporific. The lady had been suffering with night-sweats so profuse that her clothes were changed twice every night. After taking this powder, she asked him whether he had mixed anything for those sweats in it. Further experiments showed that in most cases night-sweats could be prevented by one-half gm. of sulfonal. He considered the effect of sulfonal to that of atropin, but it is wholly free from unfavorable side-effects. Moreover its effect is lasting, the sweats of the second night being much less profuse without sulfonal.—*Therapeutische Monatshefte*, March, 1889.

A STANDARD PAGE FOR REPRINTS.

Dr. Charles Everett Warren, in the *Boston Medical and Surgical Journal*, March 7, 1889, makes the following suggestion:

The writer has a room full of reprints, catalogues, bulletins, and the like, and has tried every way imaginable for preserving them in order. Such as match in size can be bound together, others varying in size are put into numbered boxes. Others lie around promiscuously until some one, tired of seeing and moving them about, puts them into the basket. Circulars are supposed to be folded to a postal card size, endorsed and filed in a card index, together with cards containing references to the reprints, etc.; but with the best system it is difficult to arrange the mass of material in a satisfactory manner, so as to be easy of access, and therefore much of it is lost.

The remedy for this existing evil is uniformity in size of pages, a remedy easily applied, if those who issue the printed matter will co-operate in its application and those who receive the matter will demand this. I suggested some years ago that a uniform size of page be adopted by mutual consent as a standard. The most convenient size would be the 8vo. There is nothing that could not be well represented in one of these sizes. The value of a catalogue with standard pages would be one hundred per cent. greater than one a little off size, as the former could and would be preserved for future reference, while

the latter would be thrown away, even if it contained valuable matter, as it would be a nuisance and a clutter-monger; even if preserved it would be amongst such a heap of good, bad, and indifferent, and its position would be so uncertain that few would waste the time and the patience to hunt it up, provided it was not forgotten. Out of sight, out of mind; one might as well be without a thing altogether as to not know where it is or be unable to find it. Important as this question of uniformity is in the mercantile world, it is of still more importance in the scientific world. Monographs, reprints, and the like, have a historic value aside from their present intrinsic worth, and any point in their make-up tending to further the possibility of their preservation in a form suitable for reference, is worthy of careful consideration and adoption.

Other points favoring preservation of printed matter are good paper, type, ink, and presswork; and intelligible description free from bombastic or ambiguous terms. A few positive statements of facts are much better than a mass of superlatives which contradict facts on their face. Our language is in need of a new degree of comparison, for superlatives have done so much duty as positives that we have no means of expressing the highest degree. Illustrative cuts are of great value, but they should be drawn to scale, and every description of apparatus should bear the date and give the price.

ABSOLUTE SIGNS OF DEATH.

Dr. B. W. Richardson suggests the following signs as actual proofs that must be made in order to demonstrate satisfactorily that life is extinct: (1) Respiratory failure; (2) cardiac failure; (3) reduction of temperature below the natural standard; (4) the presence of rigor mortis and muscular collapse; (5) coagulation of blood in the veins; (6) the presence of putrefactive decomposition; (7) absence of a red color in semi-transparent parts under the influence of a powerful light, such as that from a magnesium lamp; (8) absence of muscular contraction under the stimulus of an electric current; (9) the absence of the red blotch under the skin after the subcutaneous injection of ammonia; (10) absence of signs of rust on a bright steel needle after plunging it deep into the tissues.

THE BROOKLYN MEDICAL JOURNAL

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III., No. 10. BROOKLYN, N. Y., OCTOBER, 1889. WHOLE No. 22.

ORIGINAL ARTICLES.

THE FUTURE OF MICROSCOPY.

BY C. HEITZMANN, M.D.

Presidential address delivered before the Brooklyn Medical Microscopical Society of Brooklyn, at their meeting on April 3, 1889.

In assuming the chair of this Society, I cordially thank you for the honor conferred upon me, quite unexpectedly indeed. Neither am I an office-seeker, nor have the views, announced by myself in 1873 and strongly upheld ever since, gained sufficient ground in the scientific world to warrant anything like a majority, which is the leading power in politics as well as in science. From addresses delivered before you and the demonstration of specimens illustrative of my views, you undoubtedly will have obtained the impression that these assertions are not floating in a vivid imagination altogether, that, on the contrary, they are well based upon facts demonstrable without difficulty to eyes already trained for microscopical work. This could have been the only ground upon which I was eligible to the first office in a society largely made up of erudite men, who, aside from the strife for bread and butter, such as medical practice is, have the ambition to increase their knowledge in a strictly scientific realm, *i. e.*, microscopy. Were I the visionist my opponents assert me to be, you certainly would have been loth to offer me the chair.

It affords me pleasure on this occasion to give you a brief account of the novel views, particularly the advance they have made in this country in the last fourteen and a half years, and try to sketch their eventual destiny, as L. Ranvier, the celebrated French histologist says, the microscopy of the future. When, some thirty years ago, Richard Wagner spoke of the music of the future, he was laughed to scorn, more especially, when, in his indomitable manner, he attacked the Hebrew race, both as far as musical talent and protection and support of such talent were concerned. He was fought down by gifted, nay, ingenious writers, who have never ceased to bespatter his person and his work with the venom of satire and with their utmost capacity of ridiculing everything that he said and wrote. This man is dead since several years, and if you wish to see what the success of Wagner's critics is, look at the crowds of enthusiasts thronging the doors of the opera house whenever a Wagner performance is rendered. Probably this genius would have been lost during life, broken down by adversities and poverty, had he not found a generous supporter in the person of the Bavarian King, Ludwig II., just the same as the greatest composer of all ages, Beethoven, would have been lost, had he not met with appreciation and encouragement in a few aristocratic families of Austria. Struggle for existence is certainly spared to none; but struggle for bread is the dreadful enemy of a working mind. He who exhausts his forces in swimming against the current of vulgarity and superficiality, gaining strength merely from his innermost sacred conviction and the hopes of final acknowledgment, easily succumbs, if in addition to his mental exertions, anxiety for sheer existence, the care for bread for himself and his family, prey upon his mind.

When my aims to receive an official position had failed in Vienna fifteen years ago, I did not lose courage, but undertook to establish a new position and a school for the promulgation of my teachings. I came to the United States, a man of ripe age with wife and three children, bringing along a moderate fortune, the hard earnings of my labors in Vienna. My few friends in New York laughed at my idea to open a school, entirely on private means, for teaching theory and biology in the United States. "Here is no soil for such work," they said; "you will soon find it out. You will be ignored; you will starve and be lost. You had better fill your pockets, as almost all your immigrant countrymen do. Be a business man; be a practitioner; learn to cure your patients quicker than others can, and your fortune is made. Leave science alone; in this country everything tends toward material welfare, moneymaking."

I was, however, determined to give my plan a fair trial, not despairing too soon, combining practice with science, and opened a

laboratory on the first of November, 1874, at the top floor of my at that time rented house. Four tables and four microscopes that I had brought over from Europe formed the stock in the new enterprise. The first two years passed in a rather gloomy way. I was known too little and had no sufficient control of the English language. But soon the attendance in my laboratory increased from month to month, and on many days we counted up to forty persons coming to seek information and study specimens. To-day I dispose of fifteen working tables, and as many microscopes of the best quality, and the number of attendants has reached nearly one thousand.

Some of my friends once brought a gentleman to my laboratory who, as I learned afterward, was an enraged Know-nothing, bitterly opposed to every foreign element. After he had listened to my address for an hour, he shook hands with me and said, "Doctor, you are worth more than twenty thousand of your countrymen, immigrants to the United States!" I confess I felt proud at this judgment.

Still I would not have reached the height of material welfare had I not found a warm-hearted friend, who, although no physician, but a broker, a financial genius, fully appreciated my efforts and helped me to be independent of daily cares of life. This man was C. F. Woerishoffer, a German, the most generous and magnanimous man I have ever met, the only true friend I ever had. He is dead for nearly three years. I am allowed now to make his name known to the world, a thing which he would not permit during his life, being a prince in wealth as in character. Be blessed, dear friend, for what you have done! The seed you have sown into a fertile soil has brought fruit, and your name shall be remembered as that of a benefactor to a disciple of science and that of a supporter of scientific work.

At present, active work, instruction, is going on in my laboratory as lively as ever. When, after having seen a number of patients in my office, I can run upstairs to teach my friends and to investigate the marvels of nature in either her physiological or pathological aspects, I am a happy man and find consolation for the hardships and disappointments of practice of medicine and the unavoidable contact with all sorts of people. In my laboratory I feel as if in the heavens. To try to solve Nature's puzzles is an occupation worthy of an honest man and a man fond of thinking. Nature will never disappoint us if we seek the truth. Ingratitude, vulgarity, and profanity do not exist in the laboratory; here we are the high-priests of the virgin science. What a poor physician is the man whose only ambition is to treat patients, the more the better! How true is the old Latin adage, *Scientia in theoria virgo, in praxi meretrix*! Woe to him who has no ambition to learn how the organism is constructed. He is very much like

the engineer who tries to mend derangements of the engine without knowing of what material it is made, what the cause of such derangement is, and where it is located. This is dabbling, experimenting with the human body, without logic, without sense. What experience is worth is expressed by a celebrated, though rather rough German surgeon, who said: "An ass remains an ass even though he grows old; but if a physician grows old, they call it 'experience.'"

Permit me now to give you a condensed account of the novel biological views that had been gained from facts easily demonstrable to educated eyes.

"The animal body, as well as the plant, is made up of cells and their derivations." This is the view held since 1839, when first announced by Theodor Schwann, even in our days by a majority of biologists. The cells are the seats of life, and every cell originates from a cell, as we have learned from Rudolf Virchow. Well, what is a cell? The best answer is given by the English physiologist, Drysdale, who says that a cell is a gun without a barrel and without a lock. Eminent observers, among others Max Schultze in 1861, have declared that the word cell is a misnomer, for the ideas connected with the morphology and biology of the cell since 1839 have undergone considerable alterations. The most refined definition describes the cell as being a lump of structureless protoplasm, destitute of both wall and nucleus. How small must be such a lump to be entitled to the name of a cell? Nobody knows. The spore is a cell, so is the fungus. The ovum is a cell, and by division it multiplies into a large number of cells, composing the fully developed animal or vegetable organism. The red blood-corpuscles are cells; so are the ganglion corpuscles of the gray nerve-tissue cells, notwithstanding the fact that they have originated from coalescence of a number of cells. The germs of fungi floating in the air, though invisible, are cells nevertheless.

"The cells are cemented together by a lifeless intercellular substance, much like a chimney is composed of bricks and intervening cement." This is another doctrine, which can give no satisfaction, for it has never enabled us to understand the development of the tissues, or the continuity of their action throughout the body. The nerves and their central elements, owing to their acknowledged continuity, represented the only tissue intelligible in its physiological activity; though there had been writers who claimed that the axis-cylinder is a liquid, or that it is interrupted at the septa of the medullary sheath. How could we explain the transmission of nervous impulse to the muscle fibre, if these were isolated formations; how the contraction of the muscle fibre itself, if the sarcous elements formed isolated rows and were isolated themselves within the row? I was much amused to

read a recent article by Graf See, in one of the prominent German journals of microscopy, who gives accurate pictures of a developing omentum, and comes to the desperate conclusion that we cannot understand the formation of basis-substance with the views upheld in our days. Thomas H. Huxley, in 1853, declared that the formation of dentine and enamel is not intelligible on the ground of the cell doctrine. With this view, blood is a tissue too, though a liquid one, the blood-corpuscles being the cells, the serum the intercellular substance. Puddle-water is, in this sort of logic, likewise a tissue, for every drop swarms with thousands of cells, respectively organisms. The secretion theory has still advocates, who claim that the cell, at a certain period of development exudes the intercellular substance. Poor cells, the savants let you perspire at random because they cannot help it, though they have never seen a cell perspire! How about the connections of the cells, so conspicuous in myxomatous tissue; are they mere exceptions to the rule? What shall we make of the canaliculi of bone tissue, traversing the hard basis substance and interconnecting the bone-cells? A. Kölliker, the renowned German histologist, gave us the answer by saying that the canaliculi of the bone-tissue originate like the pore-canals of plants. Does anybody know how the pore-canals arise? No. But it is a favorite method with microscopists to explain the unknown by the inexplicable. The cartilage corpuscles are considered as isolated cells imbedded in a tough intercellular substance like raisins in a dough. Whenever twin or triplet formations of cartilage cells were seen, this was a striking illustration of cell division to almost all microscopists, the tough substance around them being forgotten altogether. How is it that mere deposition of lime-salts in the apparently hyaline intercellular substance of cartilage is sufficient to bring to view numerous interconnecting canaliculi? Sure enough, this happened exactly on the plan of the pore-canals of plants. Where is the origin of the canaliculi of dentine holding the dentinal fibres to be sought? Has anybody even approached logic by trying to explain the formation of dentine by assuming a direct transmutation of odontoblasts into basis-substance? Intercellular or basis-substance is inert, is "formed" material, says Lionel Beale, and with him the two most active tissues, muscle and nerve tissue are formed material also.

I have given you a few examples of the fopperies which pervade histology worse than a Bedlam. No wonder that many a bright man has left histology in despair and disgust, as something utterly incomprehensible. When, years ago, a bright physician told me that he knew nothing about histology, I reminded him of the fiddler, who after performing went around to collect money. A guest declined

payment, giving as an excuse that he did not hear anything of the fiddler's music, whereupon that person exclaimed, "Be glad of it!"

Nevertheless, the key is found which renders the organization and locomotion of protoplasm intelligible, that solves well-nigh all the puzzles concerning the construction and development of the tissues in a logical manner. To-day we can comprehend the uniformity of all the varieties of connective tissue, their easy transformation of one into another, the continuity in the action of muscles and nerves and in the body as a whole.

The main aim of histological microscopy, seems to me, is to find out where the life is located. That the liquid contents of the cell, in the sense of Schwann, could not be the seat of life, was evident enough, since no liquid can ever be living. That the mucous or gelatinous substance building up the cell, in the sense of Dujardin, Virchow, and afterward termed "protoplasm" by Hugo von Mohl, Max Schultze, E. Brücke, and others, should be endowed with properties of life, was apprehensible but could never make us understand the amœboid motions and locomotions of a lump of protoplasm. In 1873 I adopted, in place of the abstract term "life" the concrete one of "living matter," identical with "contractile matter," and have demonstrated that this substance is apparently structureless in a juvenile or undeveloped condition only, in which no amœboid motion and no locomotion is possible. In further development such a compact lump becomes at first vacuolated and later reticulated, the network being the living matter proper with thickenings at the points of intersection, whereas the liquid filling the meshes of the network is destitute of properties of life. This network was seen before me, in a number of protoplasmic bodies, by C. Frommann, of Jena. The presence of a thin, expansible layer around the protoplasmic lump, identical in its nature with the network, would at once explain the changes of form and location through the contraction of one portion of the network and the expansion of another, with a consequent unequal distribution of the liquid in the meshes. I have asserted the presence of such a reticulum in the infusorion organism termed amœba, recommending at the same time such amœbæ for study that hold granules of foreign matter, which latter would be shot from one end of the body to the other in a purely passive way. A critic, nevertheless, objected to my assertion of the continuity of the reticulum on the ground that some of the granules are shot with lightning-like rapidity through the body of the amœba during its locomotions.

I said that the nucleus, whether solid or reticular, is a formation of living matter in a more compact form, being connected with the network of the same matter of the surrounding protoplasm by means of

delicate offshoots. Soon afterward Strassburger, Blüntschi, Flemming and a score of others described what they called "karyokinesis," or "mitosis" of the nucleus, the peculiar filamentous structure preceding its "indirect" division. The reticulum is present only at rest, such was the assertion, and as soon as division is in progress, the filamentous structure becomes apparent, the loops of such filaments being in no connection with the structure of protoplasm. The filaments and loops distinctly stained by certain anilin colors were called "chromatin," "nuclein," etc., whereas the non-stained portions were "achromatin," "paranuclein," etc. "Flemming has shown the fallacies of Heitzmann," says Kölliker. I have studied this question myself, keeping quiet all the time, since I was in hopes that the erroneous conceptions of the karyokinetists would soon be cleared up. We know that certain dyes bring forth compact masses of living matter with ease, whereas the slender formations of the same matter will remain unstained. Carmin is known for years to have done this very thing. What else can a substance be, that changes form, increases in size and splits up or divides into two or more pieces, but living matter? Is there any sense in such words as "chromatin," "nuclein?" The nucleus may temporarily be out of connection with the surrounding protoplasm, as is the case in epithelia, whenever plasmatic spaces appear in them; but is this the rule? In fresh specimens of protoplasm or those preserved in a chromic acid solution, the karyokinetic figures are never plainly marked, but the delicate conical offshoots emanating from the loops and inosculating with the reticulum are easily seen, unless a plasmatic space be present around the nucleus. As soon as we resort to anilin dyes, treatment with alcohol, and mounting in Canada balsam, the stained filaments become conspicuous; the connecting offshoots, on the contrary, being rendered invisible. This goes far to prove that the methods used for illustration of karyokinesis are good for this purpose only, destroying, as it were, just as important though more delicate features. Therefore we can make a chromic acid specimen fit for demonstration of karyokinesis by rendering the compact masses of living matter better visible at the expense of the fine portions and also that of truth. The figures of karyokinesis are artificially brought forth, and are far from giving us the proper ideas of structure either within the nucleus or the protoplasm.

One of the main reasons why the knowledge of the intimate structure of protoplasm and tissues generally has made so little headway in the last twenty years, is, in my conviction, the mounting in Canada balsam. For certain purposes, and for low powers of the microscope, for topographical views, it is unquestionably a good medium. But as soon as we wish to learn something with powers exceeding three hun-

dred diameters, Canada balsam is altogether objectionable. A suitable menstruum for microscopical specimens answering all purposes has not yet been found. For the present, however, I would consider chemically pure glycerin as the best mounting medium, since it enables us to preserve specimens, hardened in solutions of chromic acid or of chromic salts, which, as can be shown directly, do not change the structures seen in fresh specimens during an almost indefinite period of time.

The most important outcome of my studies in this line I would consider to be the assertion that in protoplasmic lumps, such as colorless blood-corpuscles, pus-corpuscles, and tissue-elements, the amount of living matter is greatly at variance according to the constitution of the individual. A compact, homogeneous or slightly vacuolated pus-corpuscle is entirely made up of living matter, and, therefore, means a brilliant constitution. A finely granular pus-corpuscle, on the contrary, with one or several distinct nuclei, means a scanty amount of living matter with plenty of liquid in the meshes of the reticulum and consequently a poor constitution. All grades of transition are traceable between these two extremes, enabling us to tell the constitution of a person from watching a droplet of urine, respectively the pus-corpuscles held therein, without ever having seen the person. This is of the utmost clinical importance indeed, and so much more valuable, as it is readily learned with powers of the microscope not exceeding five hundred diameters. Many of my friends utilize this fact practically. E. Neudörfer, of Vienna, calls it the "dawning of a new era" in microscopy, and our worthy member, Arnold Stub, an independent observer, has quite recently made public his conviction of the truth of my assertions concerning constitution and approaching death. What a prospect for scientific clinicians! A person with a good constitution will, among other things, not furnish a favorable soil for the development of tubercle bacilli, and we could almost give him a certificate that he will never become tuberculous.

I have furthermore shown in 1873, that within the tissues of the body there are no isolated cells, but that the basis-substance is pervaded by a large amount of living matter. Only the minute meshes of this reticulum hold the nitrogenous substance which varies in consistence and chemical composition, thus giving the character to the varieties of connective tissue. In myxomatous and bony tissue such connections were known to exist long since. In fibrous tissue and all varieties of cartilage, mere treatment with absolute alcohol is sufficient to bring forth the connections and the reticulum within the basis-substance. In muscle-fibres all the sarcous elements were proven to be interconnected. In epithelial tissue the filaments pervading the cement substance estab-

lish the continuity of the protoplasm. If Edw. Rindfleisch, in the preface of the latest edition of his pathol. histology admits that in our present views all the cells of the tissues are interconnected, this does no justice to the facts. We must say, the basis-substance is alive the same as is protoplasm, for both have the same structure and both are pervaded by a reticulum of living matter. Whereas in the views of the cell theory the animal body was constructed like a dwelling of bricks : the cells and cement, the intercellular substance ; in my judgment the organism is a continuous mass of living matter from the crown to the points of the toes. In previous years I used to call the body of a mammal or of man a grown amœba, with differentiations into tissues and organs. I have, however, found, six years ago, a better comparison with a large marble vase erected in front of the Berlin Museum. This is not a masterpiece by any means, and when I asked one of my friends in Berlin how it came that such a clumsy article could be put up for public admiration, he boastfully replied : "My dear sir, this is *one* piece of Prussian marble. Were this vase made up of hundreds of thousands of pieces, and were it a mosaic, it would represent the cell-theory ; since it is *one* piece, though varying in its inner structure and color, it represents the novel view."

Since we are matter-of-fact men, I have brought along two specimens of ground bone, sent to me several years ago by Dr. Loop from Deer Creek, Indiana. He was kind enough to let me have these specimens of his own make, since he knew my hobby. One of them is put up with a power of five hundred diameters, showing Haversian systems, Haversian canals, lacunæ and canaliculi ; from the latter you will see a delicate filigree emanate, pervading the whole basis substance. The other specimen is demonstrated with a power of 2,000 diameters, and beautifully exhibits the light, almost rectangular network, the minute meshes of which hold the glue-yielding basis-substance, infiltrated with lime-salts. Unquestionably in dry specimens like these, only lacunæ and canaliculi and their offshoots are seen, as if in a negative photograph ; whereas the protoplasm and its offshoots of living matter have disappeared. The image is the same as in other varieties of connective tissue treated with solutions of nitrate of silver. With such methods only the spaces holding the soft and living parts can be brought to view, representing what has been termed juice-canals since Recklinghausen. Obviously these are not juice canals, but spaces holding protoplasm. Nevertheless, even in our days, colored liquids are driven into the cornea, thereby pushing the protoplasm to the walls of the spaces and causing entirely erroneous views as to the construction of the cornea, or of fibrous connective tissue.

Botanists have of late successfully tried to demonstrate the inter-

connections of the "cells" of plants by filaments pervading the cellulose or cement-substance. Thus the cells have lost their individuality, upheld since Schleiden in 1836, and the plant becomes a continuous individual, from the points of the leaves down to the finest radicles of the roots. In this way we can understand the continuity and harmony in all physiological functions both in animals and plants.

If you ask me whether my views are adopted by microscopists of note in Europe, I can give you but one name, that of S. Stricker, in Vienna. In Germany the discipline is too great both in military and scientific affairs, as M. Pasteur has so wittingly remarked. Views not announced by a German professor in a German university cannot gain ground very easily. Stricker is convinced of the life of the basis-substance since 1880, and, as an old Greek proverb has it, "One Plato is worth more than all Greece."

Embryology, one of the most fascinating chapters of biology, contains a number of the most illogical views held at present. Geo. W. Jacoby has quite recently pointed out some of these fallacies in his presidential address before the New York Neurological Society. The majority of embryologists claim that epithelial tissue will never give rise to connective tissue, and *vice versa*. Nevertheless it is asserted that the mesoblast—the foundation of connective tissue, blood-vessels, and muscles—is an offspring of the purely epithelial epiblast, or the purely epithelial hypoblast, or of both. The central nerve organ, brain and spinal cord, is admitted to be a product of the epiblast, though far from being epithelial in nature. At least nobody, except Balfour, has claimed that the gray nerve tissue is an epithelial structure. If the epithelia were in reality such exclusive formations, giving rise to nothing but epithelia, how can the mesoblast be derived from the epiblast or hypoblast? Either there is no logic in such an assertion, or the epithelia are not exclusive in their derivations. I simply touch upon this point to show you the evils springing from the limitations of our conceptions. As far as my own researches go, I am convinced that the mesoblast grows between the epiblastic or hypoblastic layer from the periphery, the area vasculosa, and intimately connects with the epiblast at several points, especially also at the point where the medullary furrow, the future central nerve-organ is forming. I am far from claiming any exclusiveness for the epithelia, admitting, on the contrary, that connective-tissue formations may be derived from them.

Pathological histology swarms with conceptions and assertions lacking logic altogether. From this vast realm I would select but one chapter for consideration, on account of its great importance, that of inflammation.

The doctrine of inflammation plainly illustrates the fact that fashion

largely prevails in our pathological views. When, in the fifth decade of our century, humoral pathology held sway over the minds of microscopists, inflammation was thought to be a derangement of the blood, and all inflammatory new formation, including that of pus, to be a product of the blood, respectively the exudate. It was the great merit of R. Virchow, in the sixth decade, to overthrow these views by demonstrating that the inflammatory and pus corpuscles originated from the "cells" of the inflamed tissues, at that time looked upon as the only living and active parts of the tissues. This so-called cellular doctrine was adopted by the founder of humoral pathology, C. Rokitsansky himself. In the seventh decade Cohnheim discovered the emigration of colorless blood-corpuscles from the small veins and capillaries of the exposed mesentery of the frog, and soon afterward he claimed that inflammation was nothing but emigration of such corpuscles, the cells of the inflamed tissue taking no part in the morbid process, but simply perishing or disappearing. It is almost incredible that this hasty assertion was believed by the majority of German and American pathologists for over twenty years, notwithstanding the efforts of a few good observers who urged the correctness of Virchow's view. Is it possible, we may justly ask, that there should be nothing in the tissues capable of existence, that nothing should be able to react upon irritation, that colorless blood-corpuscles would take the place of a tissue lost sight of in inflammation? Cohnheim himself, in later years, admitted that the cells proliferate and produce inflammatory corpuscles in what he termed "reparative" inflammation, known also under the name of formative or plastic. But with many pathologists inflammation is still emigration of the leucocytes; and pus-corpuscles, to be sure, are nothing but leucocytes. What a discipline, what lack of logic, of observing capacity!

When, in 1873, I demonstrated the life of basis-substance, the necessary outcome of this view was that the basis-substance participates in the formation of inflammatory or medullary corpuscles as well as the cells themselves. I have shown that after the liquefaction of the basis-substance the living matter previously concealed therein becomes free, grows up from granules to lumps, and produces a large number of inflammatory corpuscles. Those remaining interconnected still represent a tissue in an embryonal condition, from which new tissues may arise by fresh depositions of basis-substance. Should, however, the living connections be interrupted, the inflamed tissue breaks asunder into pus-corpuscles. S. Stricker, the most zealous opponent to Cohnheim's idea, has since 1880 adopted my own views; but all his efforts in directly demonstrating, with the electric microscope, the tissue changes occurring in inflammation proved of little avail. We can

see, however, that the emigration theory is fast losing ground of late, even in Germany. Bacteriological research has come to our rescue, since it was demonstrated that a mere accumulation of leucocytes is not entitled to the name of an abscess, and it is the disintegration of the inflamed tissue that gives rise to suppuration. How long will it take to convince the stubborn minds of German, not to speak of the comparatively small number of American pathologists, that they have been blundering for over twenty years, merely for the sake of discipline?

Quite recently I have listened with some amusement to a paper read in the New York Neurological Society, on the microscopical changes in the gray substance in artificially induced myelitis. The work was done in the Baltimore Laboratory. It is maintained by the author that the offshoots of the ganglion cells first disappear, then the ganglion cells themselves, and at last the whole gray matter, nothing remaining but emigrated leucocytes. Is it possible that such assertions should be brought forth by men claiming to be intelligent? The most active, highly refined tissue of the gray nerve-substance should react upon irritation by simply disappearing! How can all that was done for a number of years past by independent and accurate observers in New York be ignored in Baltimore? Here, as well as in Vienna, it was shown that the ganglionic elements in inflammation break up into a number of medullary corpuscles, probably the same from which they have taken origin; that the axis-cylinders become enlarged, varicose; and that the living matter of the gray substance, being reticular in arrangement and free from any basis-substance, gives rise to a large number of inflammatory corpuscles. Should these elements break asunder, an abscess will be the result; if, on the contrary, new basis-substance, absent in normal gray matter be formed, the outcome of inflammation will be the new formation of fibrous connective tissue, so-called sclerosis. From a serous imbibition of the gray matter, atrophy may either result directly, or shrinkage will take place secondarily, after preceding sclerosis.

Based upon my own researches, I have denied the possibility of a pure parenchymatous inflammation in the sense of Virchow, which means an inflammatory process starting and running in the epithelia alone, without materially affecting the subjacent connective tissue. I claim that inflammation invariably starts in that tissue which holds the blood-vessels, *i.e.*, the connective tissue. The epithelia will either become desquamated, washed off, or be transformed into indifferent or medullary corpuscles, which, irrespective of their origin from epithelia, give rise to connective tissue, thus causing the terminal process of shrinkage of the organs known by the term "cirrhosis" in the liver, the kidneys,

the lungs. This fact is objected to by the pathologists on the merely theoretical ground that epithelia can never produce connective tissue. Why? Because Remak, Thiersch, and Waldeyer say so.

In the chapter on tumors such restrictions have wrought a good deal of mischief. Sarcoma, or, as I would prefer to title it, myeloma, which is admitted to be a purely connective-tissue growth, transforms the epithelia into sarcoma elements. This fact furnishes differential points of the utmost clinical importance, especially when we have to decide from a few shreds gouged out of the uterine cavity whether the process is merely a so-called fungous endometritis, therefore benign, not endangering the life of the patient, or a myeloma, which easily destroys life by rapid growth and invasion of the contiguous as well as remote tissues and organs. How can we understand the life and growth of tumors generally, their easy transformation from a benign into a malignant type, unless upon the fact that such tumors are endowed with properties of life all through the cells as well as the basis-substance? Change of type invariably is accomplished by a preceding liquefaction of the basis-substance and intermediate reappearance of the embryonal condition.

Everyone who has entered the study of microscopy has certainly become aware of the fact that an enormous amount of work must be done before even the crudest fallacies are corrected. The cell doctrine, with all its mistakes, restrictions, and incomprehensibilities, must be abandoned. Progress in biological research can only be possible after a certain number of independent workers have become convinced of the correctness of the novel views, and this body may eventually be instrumental in promoting them.

When, two years ago, the Medical Microscopical Society was founded, I entered it with serious doubts as to its prosperity. Will there be a sufficient number of practitioners who are willing to be adepts of science and spend all their leisure time in theoretical research?—this was the question. Thanks to the efforts of the retiring president, Dr. W. H. Bates, the society, though small, has done good work. We have a sufficient number of independent men among our members to warrant a favorable and honorable future. Still the number may be increased quite considerably. When, five years ago, I had accepted the presidency of the German Medical Society of New York, I tried hard to raise the standard and increase the membership. From 38 members the number had grown, within two years, to 190, and at present amounts to 210. It is not without pride that I can say the society of German physicians ranks among the very best of New York. Why should we not make an attempt at enlarging our Medical Microscopical Society, too? Thanks to the generosity of Dr. Hoagland, the

founder of this beautiful laboratory, we now have at our disposal a splendid meeting-place and an almost unlimited number of first-class microscopes. All that we need is original work. In previous years I repeatedly listened with pleasure to papers that brought nothing exactly new, but were illustrative of our present standing in certain questions. Such papers will be welcome in the future, too. But papers which offer new facts, no matter of what importance, will be greeted with enthusiasm. Although a man of strong convictions, and not a honey-boy, neither affable nor amiable, I pledge myself to be an umpire in the management of the discussions, and a faithful friend to every member.

A CONTRIBUTION TO THE STUDY OF TYPHOID FEVER IN CHILDREN.

BY H. N. READ, M. D.,

Read before the Medical Society of the County of Kings, June 18, 1889.

It may be remarked, incidentally to the presentation of the cases mentioned in this paper, that typhoid fever is slowly but surely on the increase in the cities of New York and Brooklyn. An examination of the health returns of the two cities, and also of the current medical literature of local publication, will, I think, bear out this statement. The health returns are, as is well known, notoriously inaccurate as respects the returns of cases of this disease, not more than one-half or two-thirds of typhoid fever cases being reported, but the large number of cases reported in the medical journals, the prominence given to the subject in the editorials of the journals, and the active and persistent efforts of the profession, as to the causation and treatment of typhoid, all show its existence to a considerable degree in the community. It has gradually come to displace the malarial type of fever, in the older and more settled parts of the country, following in this respect its well known characteristics. As new countries are settled up and towns are built, drainage perfected, etc., malaria is banished and the more formidable disease takes its place. As might be expected, children furnish a large number of victims to this malady, existing as it does to such an extent each year, and the behavior of the fever in children offers some points of difference from its course in adults. Though essentially an eruptive fever, typhoid does not attack children more frequently than it does adults, as is the case in scarlatina and rubeola; nor does it prevail indiscriminately as does variola among children and grown people alike. It is oftenest seen in adult life, the proportion of

young children suffering with it being about one in four to those of older growth. This being the experience of the best known authorities, though in my own practice the percentage has been somewhat greater, between one-third and one-fourth. Typhoid fever also presents another rather anomalous trait, in that although one attack protects the system from another, yet the disease is not contagious at all. It is on the whole rather an exceptional disorder though belonging undoubtedly to the exanthematous group of fever. The idea of this fever being contagious seems to have lasted much longer in this country, if we are to judge by the Board of Health laws of different cities, than in Europe. The early editions of both Vogel and Stewer, authorities on children's diseases published in 1870 and 1871, both state emphatically that typhus abdominalis, which is the German name for our typhoid fever, is not contagious. The old editions of West, Hillier, Ellis, and other English authors, say the same thing. No satisfactory reason has been yet assigned why more adults than children are attacked by typhoid fever; nor is it known why more males than females suffer from it, though most authorities think this latter statement erroneous. However, all agree that more cases are reported as occurring in males than females, and this, strange to say, holds good as regards children also. It seems probable, however, that as more cases are reported in the future and larger tables are prepared, that this discrepancy will disappear, at least in children. In reporting my cases I have limited the returns to children under ten years of age. Cases have been reported as occurring in children as young as two weeks only (Vogel, Day, Eustace Smith). The youngest case which has come under my observation has been in a child four and a half month's old. Under two years of age the disease is rare, and increases in frequency from this up to ten years. The whole number of my reported cases is twenty-two, occurring during a period of about five or six years, the ages of the patients ranging, as said, between four and a half months and ten years. Of the whole number there were thirteen boys and nine girls. Seven cases of the fever were clearly imported to the city, the patients being taken sick with the disease within a week or ten days after coming home from various health resorts. Two other cases were probably imported. The remainder undoubtedly originated here. Of the seven cases clearly imported I forgot to mention that two were brought home sick. Of the two doubtful cases I may remark, that the children had made repeated trips back and forth from home to the country, so that it was difficult to fix the responsibility on the exact place of origin. The greatest length of duration of the fever was forty-two days—in the case marked No. I., on my list, a delicate little boy, B. H., *æt.* four years.

The shortest duration of the fever was seventeen days, in Case No. X. on the list, a female infant four and a half months of age. The child died on the seventeenth day of her illness. The highest recorded temperature in my cases occurred in case V. (A. G.), a healthy girl of eight years of age, in whom the thermometer registered $106\frac{1}{4}^{\circ}$ during the second week. The fever lasted over four weeks in this case, recovery taking place. One death occurred in the twenty-two cases, Case X., female, æt. four and a half months, mentioned above, making the percentage of deaths rather more than four and one-half per cent. The average duration of the fever in the twenty-two cases was about twenty-five days, a little more than three weeks each. Diarrhœa was present in every one of my cases; fourteen exhibiting it from the commencement of the sickness, and the others showing it later on. Accompanying this also was tympanites, present without exception in every case, as was also gurgling, and tenderness on pressure in the right iliac fossa. The characteristic eruption was found in sixteen cases, more than two-thirds of the whole. It appeared in different degrees of intensity, from a few rose-colored spots on the belly and chest, to a thick, dark red, papular rash, so extensive as to give rise to doubts as to whether the case was not one of measles. This was in Case II. on my table, E. S., æt. three years, girl. This was a most interesting case. The whole family, the nurse maid, child, and mother being successively stricken down with typhoid fever on their return from the country. The nurse was sick when she reached home, the child was taken sick within a week after her return, and the mother about three weeks after. In all three cases the eruption was very extensive, especially so in the child and mother, and all three cases were very severe in character. Recovery took place in all. The fever lasted four weeks in the child, and the temperature repeatedly rose to 105° F. The eruption was noticed rather earlier in the disease than is usual in adults in all my cases (this being a point of difference in the two classes of cases), appearing generally by the end of the first week, or in some cases on the fifth and sixth day. It is generally agreed that the rash does not make its appearance as often in children as in those of maturer years, though I believe it is oftener present than some authors state—Wood, Hænoch. The eruption came out in successive crops in my cases till the end of the third week. The “*tache cérébrale*” of Trousseau was obtained in all the cases, but, as is well known, this symptom possesses no diagnostic value. Epistaxis occurred in three cases, something over thirteen per cent. The profuse hæmorrhages which sometimes occur from this source following a sudden fall in temperature I have never observed. Neither have I seen in my cases the severe and sometimes fatal hæmorrhages from the bowels which not unfrequently complicate the fever in adults.

All authorities state that this is rare in young children, though cases sometimes occur. Slight hæmorrhage was observed in four of my cases. The lesion of the small intestine which is characteristic of typhoid fever, is much less severe in the young than in the adult, the ulcerative process being less deep and extensive, and the liability to loss of blood therefore is much lessened. When bleeding to any extent takes place it is apt to be followed by fatal collapse. Earle, of Chicago, and Henoch, both report a case of this kind, the former in an infant twenty-two months' old, and the latter in a girl of ten years of age, and both fatal within a short time. No cases of perforation of the gut, adhesion or of peritonitis took place among my cases.

The disturbances of the digestive system which occurred in all my cases were limited to those usually seen in typhoid fever, loss of appetite, nausea, thirst, etc. Excessive irritability of the stomach was seen in only two cases. The cerebral symptoms of the fever were seen to a greater or less degree in all my patients. The very marked brain disturbances so often seen in grown people are rare in children. Very active delirium lasting for some days was seen by me only twice. One case, No. IX., A. M., boy, æt. four years, was taken while at dinner with violent vomiting and diarrhœa. As he was previously quite well, he was supposed to have eaten something which disagreed with him. I saw him in the evening of the day he was taken, found the diarrhœa and vomiting still continuing, and also found that active delirium had supervened. He screamed, raved, and was very violent. This condition of active delirium continued, more or less controlled by medicines, for nearly twelve days. He then became dull and stupid and nearly comatose, neither moving or speaking for three or four days. He finally made a slow recovery, the fever lasting four weeks. The convalescence was very tedious. The case was at first thought to be one of tubercular meningitis. The other case of acute delirium was in Case XV., L. A., girl, æt. seven years, and lasted nearly six days with brief interruptions. (Dr. William Wallace detailed a case of his to me, that of a child of three years of age, who was seized in a manner similar to the one I have described as Case No. IX. The child continued delirious, and died comatose in a day or two. Meningitis was supposed to have been the cause of death till the autopsy revealed the characteristic lesions of typhoid fever.) These cases are rare, but the possibility of their occurrence must not be overlooked. Four of my cases presented the low form of delirium with the heavy stupid condition of the mind. The circulatory symptoms were not marked in any of my cases. The respiratory system was involved in seven cases, nearly one-third of the whole. Four of these seven were cases of pneumonia of the hypostatic kind, and developed late in the sickness.

The other three were cases of catarrhal bronchitis. The fatal case on my list, No. X., was one in which the fever was complicated with bronchitis.

Convalescence in young children and infants is usually more rapid than in adults. In my cases convalescence took place in the average number in about four to five weeks.

Sequelæ were noticed in only three cases, two of which showed albumin in the urine, and one necrosis of the tibia. All recovered. I append herewith the table of my cases in the order of occurrence.

CASE I.—B. H., boy, æt. four years. Duration of fever forty-two days. Highest temp. 105° .

CASE II.—E. S., girl, æt. three years. Duration of fever four weeks. Highest temp. 105° .

CASE III.—C. W., boy, æt. nine years. Duration of fever three weeks. Highest temp. 104° .

CASE IV.—L. D., boy, æt. two and a half years. Duration of fever thirty days. Highest temp. 104° .

CASE V.—A. G., girl, æt. eight years. Duration of fever four weeks. Highest temp. $106\frac{1}{4}^{\circ}$.

CASE VI.—E. R., girl, æt. ten years. Duration of fever five weeks. Highest temp. 106° .

CASE VII.—H. R., boy, æt. eight years. Duration of fever twenty days. Highest temp. 103° .

CASE VIII.—F. R., boy, æt. four years. Duration of fever five weeks. Highest temp. 105° .

CASE IX.—A. M., boy, æt. three years. Duration of fever four week. Highest temp. 106° .

CASE X.—M. D., girl, æt. four and a half months. Duration of fever seventeen days. Highest temp. 105° .

CASE XI.—B. W., girl, æt. four years. Duration of fever three weeks. Highest temp. 105° .

CASE XII.—B. P., girl, æt. seven years. Duration of fever three weeks. Highest temp. $103\frac{1}{2}^{\circ}$.

CASE XIII.—H. P., girl, æt. one and one-half years. Duration of fever four weeks. Highest temp. $105\frac{1}{2}^{\circ}$.

CASE XIV.—T. R., boy, æt. ten years. Duration of fever three weeks. Highest temp. $103\frac{1}{2}^{\circ}$.

CASE XV.—E. B., girl, æt. Duration of fever eighteen days. Highest temp. 103° .

CASE XVI.—L. A., girl, æt. seven years. Duration of fever four weeks. Highest temp. 104° .

CASE XVII.—M. S., girl, æt. four years. Duration of fever twenty days. Highest temp. 103° .

CASE XVIII.—T. L., boy, æt. three years. Duration of fever seventeen days. Highest temp. 103° .

CASE XIX.—S. B., boy, æt. three and one-half years. Duration of fever twenty days. Highest temp. $103\frac{1}{2}^{\circ}$.

CASE XX.—R. W., boy, æt. four years. Duration of fever three weeks. Highest temp. 104° .

CASE XXI.—G. A., boy, æt. five years. Duration of fever four weeks. Highest temp. 104° .

CASE XXII.—S. R., boy, æt. four years. Duration of fever twenty-six days. Highest temp. 105° .

Treatment.—The treatment adopted in all my cases was limited to the attainment of two objects, viz., to keep the fever within the safety limit if possible, and to support the strength of the patient. As long as the temperature was kept under 103° F., little medication was used; if it went beyond this point, febrifuges were given p. r. n. Antifebrin and antipyrin were used to some extent, but my chief reliance has been on the cool sponging of the surface of the body with water at about 85° to 90° F. To the water a little bay rum or alcohol was added. The sponging process was repeated every second or third hour. In the very high temperatures, 105° F. and over, the antifebrin and antipyrin were very satisfactory in their action. Stimulants were used in all my cases, generally commencing at the beginning of the third week, in some cases earlier. As is well known their employment demands close watching, and should not be given too early. Opiates and astringents were not used. Milk was the principal article of diet in every case, and indeed the only one for the first two weeks of the fever. To this was added the beef peptonoids, meat juice, and beaten egg from time to time, and gradually farinaceous foods.

In conclusion, I present the following points, which seem to be established from this series of cases:

First.—Typhoid fever attacks young children only about one-third or one-fourth as often as it does adults.

Second.—As far as is known, it attacks boys more frequently than girls.

Third.—The prognosis is better in young children than in grown people, the percentage of deaths being from two to six in the hundred, while in the adult the death rate is from eight to twenty per cent., according to the authority quoted, differing in different places and epidemics. Murchison, of London, whose fever reports are probably the most extensive, gives the mortality in the London hospitals through a series of years as 15.6 per cent. Hutchinson, quoted from

Pepper's System of Medicine, gives the mortality at the Pennsylvania Hospital, during a period of twenty years, as 19.5 per cent. Liebermeister states the mortality at Basle through a long period, to have been from 27.3 to 8.2 per cent., the difference being due to the treatment.

Fourth.—The treatment best adapted for typhoid fever in children is that which keeps the temperature within reasonable limits without attempting to force it down too far, and supports the strength of the patient until the disease is spent and the fever has left. Any procedure which has neither of these two objects in view is unnecessary and harmful, and it is far better not to treat the disease at all than to treat it too much. The more powerful depressants, aconite, veratrum viride, gelseminum, etc., are contra-indicated. The ordinary diffusible stimulants, ammonia, nitrous ether, etc., and the usual heart tonics, quinine, digitalis, etc., are not needed, and therefore may do harm. The best febrifuge is the cool sponging with water at 85° to 90°, assisted, when the fever rises to 104°, by the antipyrin or phenacetine. Alcohol in some of its various forms is the best stimulant. Milk is the best diet.

DISCUSSION.

Dr. O'CONNELL.—I would like to ask Dr. Read if he noted nose-bleed in any of his cases, as an early symptom.

Dr. READ.—I think I mentioned three in my paper.

Dr. O'CONNELL.—I speak of that for the reason that I saw some cases of typhoid in children ranging from ten years down, through an entire family of six. The most persistent nose-bleed was in a girl of ten, and it lasted intermittently for three or four days. She ran through the typhoid, and finally got better. Then a boy of eight was taken with a hæmorrhage of that character, not so persistent, but still quite severe. I don't know that I would have recognized these cases as typhoid thus early had it not been that the father of these children had a well marked attack.

Dr. WALLACE.—I do not know that I can add anything to what Dr. Read has so well brought forward.

One point occurs to me, that is the difficulty of at times distinguishing typhoid in children from certain forms of low remittent fever. They closely resemble each other in history and symptoms.

INJURIES TO THE SKULL, WITH SOME OBSERVATIONS ON ONE HUNDRED AND EIGHTEEN CASES.

BY THOMAS H. MANLEY, NEW YORK,

Visiting Surgeon to Harlem Hospital.

Read at the Seventh Special Meeting of the Fifth District Branch of the N. Y. State Medical Association, held in Port Jervis on August 27, 1889.

After having an experience of now something more than seven years in dealing with various wounds of the body, and seen in that time more than a hundred skull fractures, I think, at least, it will not be claimed that I write without some extensive observation.

I have seen every square inch of the skull broken by causes of every description, by blows, falls, shots and punctures; and have seen many forms of modern treatment applied.

I now feel that my theme would result in very much good, if I could extinguish some of the delusions, which many are laboring under at the present time, through the rather bright-colored reports and intemperate enthusiasm, of a few contemporaneous writers, on traumatism of the skull.

Sometimes morbid growths may be diagnosticated within the cranium, and sometimes, too, they are located, and the skull bored, but they are not found, and the patient dies. The removal of neoplasmata from the brain is not a difficult procedure with a competent anatomist and dexterous operator.

So much having been generously contributed lately to us by well known members of our profession in this country and Europe, in the way of surgery of the head and its possible future, let us see how newer methods of treatment, and technique of operations, have modified or effected results.

Before dealing with lesions of the skull, it becomes necessary to review its anatomy and perhaps some of its physiology; but it seems indispensable that a thorough knowledge of structure is needed before one can intelligently discuss injuries, etc.

Of the three closed cavities of considerable size in the adult, the cranial, is the only one composed exclusively of bone. Oval in shape, the skull is formed of two layers, or plates of bone, with an interspace for cancellous tissue and blood-vessels, the veins of the diploë. The inner table is rather thinner and more brittle than the outer, and is lined by the dura mater. The outer is the stronger, thicker, and more elastic, covered by the pericranium.

The veins of the diploë run in grooved channels, have very thin

coats, and communicate through small foramina freely with the scalp externally, and the vessels of the meninges and the brain internally.

The walls of the skull undergo important changes in shape and consistence at various periods of life, and vary very much in different situations and individuals. They are laterally and above, arched; hence, so shaped as to resist in a great measure, the effects of force or pressure.

The brain substance, which fills the cranial cavity, is of an elastic, resilient, compressible character, varying in fulness and volume according to circumstances. It bears evenly and with uniform pressure against the broad, flat bones which encase it, and owing to its semi-liquid, pulpy quality, readily transmits vibrations, from one part to another; and though so carefully guarded against injury, in its bony encasement, it tolerates manipulation and even mutilation to a greater degree, without immediate danger to life than any other viscus of the body.

With respect to the circulation within the brain, we are all familiar with the divergent views of writers; some, maintaining that the cavity, being hermetically sealed, is not subject to atmospheric pressure, the quantity of blood being always the same. Others deny this, and hence, have sought to prove by experiment, that in anæmia, there was a diminution, and in congestion, an excess of the normal supply. Indeed, one well known physiologist says that the valves, in the jugulars, always prevent the blood current, from welling upwards, and over-distending the cerebral veins.

This is an erroneous assertion, for anatomists declare those valves, or cul-de-sacs, as incompetent; besides any one who has seen the exposed brain, knows that the venous system, within it, undergoes every variety of distension, as with every effort, while coughing, sneezing, or straining of any kind, the vessels greatly distend. Physicians have reported many cases of apoplexy, as due to straining at stool, resulting in over filling, and bursting of the vessels; and any one, who has seen a woman in the throes of labor, knows when a long severe pain develops and the breathing is momentarily stopped, how dark and livid the face becomes, and how the superficial jugulars stand out. However, to positively decide the matter, I have in four subjects, removed the jugulars from the neck, and tested the potency of the valves, and found, that in neither the superficial, or deep vessels did they offer the least resistance to water injected from below.

We must conclude, then, that the quantity of blood in the brain, or sinuses, is not always the same, in health or disease. The brain tissue through its compressibility, and elasticity will adapt itself to moderate distension of the vessels without injury, and through its expansive

properties, readily fill the void occasioned by a limited withdrawal, or diminution of the blood supply. So that it is perfectly compatible, with physiological function, to find the volume of the circulation undergoing variations.

I have a case in mind now, a living proof of the full truth of this assertion, which is not based on theory, but actual fact.

The circulation from the brain through the diploë to the scalp is very intimate, as both plates are freely perforated with foramina for the transmission of veins and arteries. The anatomical relations are important to bear in mind here, as we see in erysipelas how quickly through this connection, the brain becomes involved and the sensorium profoundly affected, meningeal inflammation frequently following.

We can take advantage of this knowledge, too, when we apply cool lotions to the head in congestion and inflammation, as when we often see them judiciously applied, they are without a rival, in quickly crushing that burning heat, of high inflammatory action.

The great venous channels we find mostly—fortunately for the surgeon—at the base of the brain. The longitudinal sinus is the largest vessel found in the cranial roof. From the brain substance we next come to that serous membrane, which lines the skull, and covers the brain. It has always seemed to me a great misfortune that anatomists by their complex and confusing description of this lymph-sac should have so embarrassed and discouraged students, and practitioners, that very few have a clear idea about this structure.

Why it has not been described as the peritoneal or pericardial-sac in a general way, as all its layers and reflexions are, histologically and physiologically, similar, if not exactly the same, seems difficult to understand, as it would very greatly simplify its description and study.

The dura mater or covering of the internal surface of the skull is a fibrous membrane, similar in structure and function to the aponeurotic lining of the abdominal cavity, except that it is thicker and denser. It has an extremely thin serous lining, is loosely adherent to the bone, and is rather a true covering of bone, than brain tissue. Some attribute to it the power of reproducing bone, but I have never yet seen evidence of this. Surgically considered, it is a most important structure, as it forms the real tangible boundary line between the skull and brain.

Lying immediately beneath it is the true serous membrane of the brain, the arachnoid, which divides the arachnoid from the sub-arachnoid cavity and covers the entire brain. The arachnoid cavity is readily demonstrable, but the subarachnoid is more easily imagined than demonstrated *on the cadaver*.

The nutrient vessels of the convolutions lie in this membrane, and through processes given off from it, dip down and nourish the superficial structure of the cranial contents. The pia mater—or what I would rather designate it—the thinnest and deepest reflexion of the arachnoid lies closely on the brain substance.

The source of sensation within the head is no doubt lodged in the meninges, as like the pleura and peritonæum, the serous coverings of this viscus are the principal means through which sensation is transmitted. I have many times had an opportunity to prove the utter insensibility, of cerebral and cerebellar tissue to irritants.

Wounds of the arachnoid, heal readily. Not so, however, with the dura mater, as we shall find when we come to deal with lesions of it.

The cranial bones are of a formation peculiar to themselves. They have no medullary substance, hence no osteoblastic layer for the regeneration of bone, but on the other hand, in middle life and youth, they are separated into two plates; the interspace occupied by cancellous tissue through which ramify the blood-vessels of the diploë. This interosseous structure becomes mostly obliterated in old age. The vessels of the diploë are very small, but in fractures of the inner table they are capable of doing a vast amount of mischief through the large quantity of blood, which escapes from them into the brain.

In some cases of fracture of the skull through both plates, where there have been very large effusions of coagulated blood found lodged between the dura mater and bone, I have often seen no rupture of vessels in contact with the extravasation, to account for it, except those through the cancellous tissue.

We can easily see why this should be, particularly when the outer tissues have not been lacerated, by the fact that fluids always go in the direction of least resistance, the dura mater being but loosely connected with the skull is easily detached, allowing the blood to insinuate itself underneath it, while the pericranium is firmly adherent and removed only with considerable force.

With advancing years—after fifty—the cancellous tissue of the skull disappears almost entirely, and both plates fuse together, so as to form really, but one.

At advanced life, owing to the want of organic elements in the osseous tissues, the cranial walls are brittle, readily fractured, and at this time too, a breach in their continuity becomes more dangerous, in fact, is nearly always fatal.

In very early age, on the other hand, when ossification is not complete, the bony covering of the brain will tolerate quite extensive injury, provided there has not been much blood lost, or the meninges ruptured, with remarkable impunity.

How many times we have seen the skull crushed in, in delivery with the forceps; indented deeply in many places; yet in a short time, adapt itself to the normal form?

Children I have found, too, recover well from fractures, *when the destruction has not been too great.*

Owing to the tendency of depressed bone in youth, to resume its former position, and the fact that children proverbially bear the loss of blood badly, I think we should be extremely cautious in cutting down on fracture or suspected fracture if they are injured about the head.

Immediately over the outer surface of the bone, we come to the true periosteal covering of the skull, the pericranium, a very thin but strong and firm tissue, very adherent to the bone; in some situations, especially under muscular attachments, it is very closely incorporated with the underlying bone. This covering alone, is ample to supply both plates of bone beneath with nutriment, and is the only one, capable of reproducing bone-tissue.

But, even this membrane, I believe, possesses the latter property, in a very feeble measure, and then, only in early life. In simple scalp wounds of the head, the integrity of this tissue is seldom impaired.

Being so closely in contact with the bone, nothing, scarcely, will make a breach in it, short of a fracture; and even here, if there is not decided depression of bone, it will stretch but not tear; hence, I have more than once seen internes, after making an exploratory incision, overlook a fracture, by not taking the precaution to *scrape* away, or elevate this thin, gauze-like covering.

Above the pericranium, between it and the aponeurosis of the occipito-frontalis, besides more or less fat and areolar tissue, we find a distinct fascia, capable of easy dissection, covering the entire head above, but not beneath the muscular attachments. It is well developed, containing fibrous tissue mostly, rather stronger than the superficial fascia of the thigh, but thinner than the fascia-lata.

I am quite sure, that it is this tissue, which sets the inexperienced astray, in searching for fracture after an injury. They mistake it for the proper external bony covering; and the pericranium being so extremely transparent and thin, they imagine it is the smooth, bare surface, of the bone itself.

The parts between the bone, and the under surface of the aponeurosis, are very vascular.

The broad fibrous expansion, which bridges over and joins the frontal with the occipital muscle, is closely connected with the scalp by connective tissue, and in some individuals, is quite movable. It is hard to conceive what purpose it serves in man, but those, who have to do with head injuries, know that its presence is often a source of annoy-

ance. Very large, and numerous vessels, pass immediately above this, through the scalp. The vessels here are especially noticeable for their thin coats, and abundance.

The hair bulbs penetrate very deeply, and seem in some situations, to even blend with the fibrous elements of the aponeurosis. The hair of the head would seem to serve the purpose of regulating the heat of the tissues beneath; certainly, in modern times, when it is mostly clipped short, it can serve no useful purpose, in moderating concussion from falls or blows.

The base of the skull, so far, has hardly been accessible to the surgeon, as we are only *positive* of a lesion in this situation when we see it, *post-mortem*.

I think it well to consider some of the fleshy lesions of the head while discussing injuries of the skull, for we seldom have the latter without the former.

The kind of injury most frequently seen in this region is the concussion. The head receives a sudden, sharp blow or fall; and the vessels being crushed between two hard substances give way, followed by free leakage into surrounding parts. Quite a large bump (*hæmatoma*) will often arise from only a moderate blow. When the force applied is very great—sufficiently to seriously jar or damage the brain—this tumor does not appear; something, I think, which is attributable to feeble heart action, shock; the blood not being effused, or forced into adjacent tissues.

It is interesting, too, to watch with what despatch and completeness the circulation will usually absorb every remnant of this large blood-clot. In twenty-four hours, the largest have faded out of sight. These *hæmatomata* often produce a sort of concave cupping at their base, which would occasionally lead a person to suppose, there was a depressed fracture, in this situation; but if there is doubt and no marked head symptoms, it is well to wait and see, how things will be after the clot has disappeared.

Lacerated wounds of the scalp are seldom seen, except associated with contusing or bruising of the parts. Their edges are irregular and jagged. We often find them of great extent. I once saw the entire scalp torn off, in a woman, by having her long hair caught in a revolving shaft.

The police do fearful execution on the head with their long, heavy hickory clubs. A sharp, swift blow from one of their night bludgeons, though with round edges, will cut the scalp and lay it down over the ear, as neatly as a knife; and here we will find a wide deviation from

the rule, laid down by older surgeons, about lacerated wounds seldom bleeding. We have torrents of blood. No ordinary pressure or stipitics will control it. Either, we must twist, or tie the arteries securely, before we close the wound.

Scalp tissue is very prone to heal; when there is no septic infection, more quickly than any other, in the body.

I once saw this well illustrated in a lunatic who, when alone, first, by pounding his forehead against the edge of an iron sink, detached the scalp anteriorly from ear to ear, and then tore the whole, down over the back of his neck, before discovered; when he was very faint from loss of blood. The parts were promptly replaced, and he made a good recovery.

We may have very serious lesions of the skull or brain without any visible lesion of the scalp; but the converse is much more frequent. How often do we see "cut heads," tears, and contusions of the scalp without any cerebral complications whatever?

Now, having noticed briefly the immediate coverings of the skull, and their peculiarities, it is in order to consider the lesions of the bone itself—fractures of the skull; and they cannot be intelligently considered without touching on the surgery of the brain.

In text-books and monographs on fractures, we seldom see anything on lesions of the cranium, as though the authors decided this region one which should be considered by itself; as though tissue formation and bone repair here, were different from elsewhere, and, accordingly, should be dealt with as a separate part of the body.

When we look into the marked, and striking anatomical and histological difference, in this structure, we can see at once, that the general principles on which ordinary breaks of bones are treated, will not apply here.

We have no true periosteum as a bone covering; no medullary canal; no large muscles to deal with, or great arteries. We have no provisional callus; and, notwithstanding all that has been said and written by recent writers in the affirmative, I do not believe that the membranous coverings of the cranium in adult life possess, in but the slightest degree, the power of reproducing bone.

Though the head contains organs vital to life, it will stand battering and bruising, with greater impunity than any other part of the body.

Wounds of the head seldom become dangerous to life, except when its walls are crushed in; and in certain stages of life, the cranial contents will safely sustain a wonderful amount of compression and displacement, without in the slightest degree impairing their integrity. I have seen the skulls of children extensively shattered without the child

manifesting the least mental derangement, the bones quickly coming together, and gaining their wonted strength, and firmness. Those of us who have ever attended confinement can bear witness to the extent of pressure and distortion the infant's brain at birth will safely endure. We have seen the head sustain the crushing force of the heavy steel-bladed forceps, in strong hands, for hours; afterwards delivered with it deeply indented in places; and yet, with all this squeezing and mutilation, no convulsions. On the other hand, in the course of twenty-four hours, we were amazed at that curious power, which the skull possesses at this age, of obliterating those deep indentations, and resuming its normal shape.

The majority of skull fractures are mortal, but the mortality depends upon many circumstances. First of importance is age; secondly, the extent and location of injury; thirdly, the manner in which the force is applied, whether direct or indirect; fourthly, the treatment.

In the last seven years I have seen one hundred and eighteen cases of fractured skulls. The results I will tabulate later on. Suffice it to say at present, the younger the patient, the better were the chances of recovery.

With those who have reached the meridian of life, or passed it, it is different, as at this stage the bones are hard, brittle and less elastic, the inorganic elements preponderate, the cancellous tissue and diploë are being obliterated; so that late in life, we find the interspace entirely obliterated, and all a solid mass of compact tissue.

The location and extent of injury. Next to the base of the skull, probably a fracture through the temporal bone is the most fatal.

I can account for it, only on the supposition that because the bone here is so thin and yielding that sufficient violence to fracture it, must do great damage to the brain.

Fractures through every part of the calvarium are frequent, the skull being thinner, and more exposed in this situation.

We can seldom estimate the extent of internal or brain injury, or foretell results by the size or limit of a break or breach into the cranial walls, as it is well known that the inner table may be extensively shattered, without any depression, or fissuring of the external; and we know, too, that a small puncture through the walls, with a stiletto or sharp-pointed instrument, may be followed by direful consequences.

On the contrary, we occasionally see extensive fissures, radiating in every direction, but no serious difficulties following, no impairment of the vital power, and a complete recovery.

We not infrequently encounter a sort of intermediate kind; those which are brought in, simply because they think they are badly injured.

They have trivial symptoms, eat and sleep well for a time, finally after a few days become stupid, drift into coma, and die if relief cannot be given.

I have seen quite a number of this description. One of the most remarkable was a man who attempted suicide. He had fired four shots, at short range, into his head, when discovered. At this time he was bleeding freely. The house-surgeon probed the perforations in the scalp, made by the bullets, and owing to the immense thickness, swelling, and puffiness of the tissues, supposed that all entered the cranial cavity.

When I saw him in the morning, I cut down freely on to the skull. The four balls were found flattened, on the pericranium. They were easily removed, and he was apparently recovering from the effects of the flesh wounds, when his temperature went up; he got paralysis and convulsions, dying in twenty-four hours after those were manifest. After death the skull was found fissured, and pus formation, in abundance, under the bone.

I have in mind three other cases, one of which occurred recently and was reported in the *Medical News*. The first came under my observation while on duty at the Workhouse. This woman was arrested in a drunken brawl, the officer securing the arrest, having to make free use of his locust. A magistrate committed her for "three months" the following day. After she "sobered off," the senior medical attendant on duty examined her, and found nothing wrong; but five days after entrance she had a fit, and died, within twelve hours. After death a fracture was found in the temporo parietal region, with a large clot underneath.

In my recent case, though our man was dazed on entering the hospital, he recovered reason, but again became lethargic. Here, again, we found a large blood-clot in the same region, as was the pus in the former, and it was readily and successfully removed, under the trephine during life. Death followed a few hours later, when another fracture of the base, extending from the large foramen forward, was discovered.

When we are reasonably assured, that the base of the skull is involved, death is inevitable, and treatment is out of the question.

Much depends on the kind of force which is applied, whether direct or indirect; whether the lesion in the cranium was inflicted by a blow or a fall.

Fractures resulting from falls, in this situation, are altogether more fatal than those caused by blows or missiles. This can be quite readily understood, when we bear in mind that the blow does only local damage; while a fall jars the whole body, often producing quite serious internal destruction, independent of the injury to the encephalon.

(To be continued.)

BIOGRAPHICAL SKETCH OF THE LATE FRANCIS WARREN ROCKWELL, M.D.

On Tuesday afternoon, April 30, 1889, Dr. Francis Warren Rockwell died, after a short, sharp struggle with an acute and rapidly spreading phlegmonous inflammation of the connective tissue of the post pharynx and mediastinum. Up to the previous Friday he had attended to his work as usual; during the preceding two months a greater amount of work, making large drafts both upon his physical strength and his mental endurance, had been done by him than during any similar period before in his professional career. On Wednesday he had shared with his chief at the hospital the anxiety and labor of a very difficult and prolonged surgical operation; in the evening of the same day, notwithstanding his fatigue, his surgical enthusiasm had caused him to attend the meeting of the New York Surgical Society, from which he returned at a late hour; on Thursday, after a full day's work and notwithstanding unusual fatigue, he responded to a call in the evening from the Lucretia Mott Infirmary, where he brought to a successful termination, instrumentally, a difficult case of labor, after this he went out through the rain to visit a professional colleague who had sent for him, finally getting late to bed, thoroughly exhausted. Nevertheless upon the morning of Friday he was again at his work. He made a number of visits and performed an operation before lunch. His throat troubled him greatly during the morning, but he persevered, and not until the most important work of the day had been attended to, did he return home. The pain in his throat growing rapidly worse, he sent for his friend, Dr. T. R. French, who on reaching his bedside about four o'clock, found him in an agony of pain.

On examination, the right half of the fauces and posterior wall of the pharynx were found to be the seat of diffuse purplish red inflammation, in the centre of which were several patches of yellowish white secretion.

The excruciating pain suffered during each act of deglutition, together with the appearance of the throat, indicated that the inflammation was of a phlegmonous character, therefore a hot water gargle and a poultice to the neck were ordered at once. The temperature was 102° . Pulse rapid and full. In the evening the pain was less, and the collection of secretion had disappeared. For a time, in accordance with the patient's wish, ice was applied to the throat, and bits of ice were allowed to dissolve in the mouth, but in the evening poultices were again applied and continued during the night. Opiates in sufficient amount to produce sleep were given. Early the next morning (Saturday) Dr. French was summoned in haste, because of

the occurrence of alarming laryngeal symptoms which had begun to appear a short time before.

On reaching the bedside the patient's voice was found to have been reduced to a whisper, and the respiration was slightly stridulous. The pain in swallowing had become so intense that even fluids could not be taken.

On examination, the fauces and pharynx were found in about the same condition as when seen the evening before, except that the uvula had become slightly œdematous. With the laryngeal mirror the whole of the right side of the larynx was seen to be occupied by œdematous swelling extending beyond the median line and cutting off entirely a view of the glottis. The glosso-epiglottic fossa was obliterated and the epiglottis greatly swollen on the right side. A laryngeal lancet was at once introduced, and the tissue to the right of the epiglottis punctured. This afforded some relief, and the patient breathed with greater ease for an hour or more, when, as the respiration became again embarrassed, another incision was made, this time lower down. As a result of this puncture the breathing became much easier, and it was thought that the crisis had passed. Shortly after noon alarming dyspnœa developed. As the necessity for tracheotomy for its relief seemed imminent, every arrangement for the operation was made, and Doctors Fowler, Cruikshank and Tieste were summoned. All of these gentlemen arrived promptly, Dr. Fowler bringing Dr. Delatour with him.

It was, however, deemed advisable to make another attempt to obtain relief by puncture through the mouth, which was done by Dr. French, who freely punctured with a laryngeal lancet the swollen tissues in the neighborhood of the arytenoid cartilage. This puncture was followed by the expectoration of a large quantity of muco-pus. The dyspnœa immediately decreased, and continued to do so till at nine o'clock, four hours after, it had practically disappeared. Immediately following the puncture, inhalations of oxygen gas were also administered by Dr. Delatour, and were productive of great relief to the patient, the pulse becoming stronger and the color of the skin better.

Drs. Tieste and French remained at the bedside during the night. Nutritive enemata were given by the nurse every three hours, and an astringent solution was thrown into the throat with the aid of an atomizer. Under the influence of an anodyne the patient slept fairly well for several hours.

Early Sunday morning he began to complain of a feeling of distress in the middle of the chest. As the hours passed this feeling of distress deepened into pain, and this moved slowly downwards towards the diaphragm and there became fixed, and grew rapidly worse.

The pulse became irregular and intermittent, and the evidences of increasing weakness were marked. Dr. McCorkle was now called in consultation. Nutritive enemata were systematically administered, for although from this time the throat gave no further trouble as regards respiration, it was impossible for him to take more than a swallow or two of nourishment at long intervals.

Substantially the same symptoms continued through Sunday night and all of Monday, except that in the evening the patient was able to take sufficient nourishment by the mouth without much difficulty. After the pain became fixed hypodermic injections of morphine were given every three or four hours. These with the nourishment were continued through Monday night.

Tuesday, April 30th, Dr. McCorkle was called at 8.30 A. M. The pulse had now become very weak, intermittent and extremely irregular. On auscultation distinct crepitation was heard over the lower lobes of both lungs, but nothing indicating implication of the pericardium. At twelve o'clock Dr. Rockwell was conscious, but growing steadily weaker. The hands and feet were cold and there was a peculiar odor emanating from the patient suggestive of coming dissolution. Hypodermic injections of digitalis and nux vomica were given, together with dram injections of brandy; brandy was also given by the mouth. At three o'clock Dr. Cruikshank was called hastily from the lower floor and found the patient sinking. Brandy was given, hot water bottles were placed at the feet, friction, indeed everything which could be of the slightest benefit, but nothing availed, and he continued to sink rapidly. Dr. McCorkle now found crepitation over the heart, which was not present when the patient was examined in the morning. It was therefore apparent that both the pleura and the pericardium had become involved in the inflammation, and that the patient was sinking from shock.

The heart became weaker, the pulse disappeared from the wrist, and at 5.45 P. M., in the presence of his wife and oldest boy, the doctor ceased to breathe.

The history and appearances of the disease and the result of the autopsy make it highly probable that the attack began with erysipelas of the pharynx and larynx; that later an abscess developed in the mediastinum, and that infectious pleurisy and pericarditis occurred as a result.

Thus was closed the career of a skilful surgeon, an enthusiastic physician, an accomplished scholar, a public spirited citizen, a true friend and a noble man. Dr. Rockwell combined in a remarkable degree most diverse qualities. He was ever thoughtful and considerate of the rights and feelings of others; it always seemed to give him

pleasure to speak well of others, and particularly to give full credit to his colleagues for their work and merit; he was like a young girl in his tendency to idealize his friends and devote himself to them. He had the soul of an artist in his love of the beautiful, and in his devotion to his home and his family he displayed the loveliest traits of his character. Nevertheless he was industrious, persevering, energetic; shrank from no responsibility; was bold and ready in the face of danger; was striving and ambitious in his plans of life, and gave full attention to the details of his work, while readily grasping broad principles.

Dr. Rockwell was tall and slender, with an intellectual face that was open and frank in its expression. His eye was quick and piercing, but its look was always sympathetic; and he ever quickly secured the confidence of those with whom he was brought into contact.

He was possessed of a highly strung nervous organization, that, while it made his enjoyment of many things more keen, also often made him the sufferer from neuralgic pangs. In general, his health was good. In 1873, however, he suffered from a severe attack of diphtheria, and in the following year, 1874, he was the subject of a second attack that nearly proved fatal. As the result of these attacks, and his naturally far from robust constitution, he was forced to husband his physical resources, which he however too often, as his friends thought, would permit to be very heavily taxed by the call of professional work. For a number of years previous to his death it had been his custom to spend about six weeks of each summer with his family at a pleasant country home in Connecticut, which his providence had secured. Here the development of his fields and his stock, and the delights of his surroundings and the society of his family and congenial friends, always served to impart to him new strength for another year's work.

One of the most charming characteristics of Dr. Rockwell's nature was his cheerful disposition. Even at times when it was but natural to expect to find him bearing the air of disappointment and even dejection, he would appear with sunny smile and cheery voice.

His cheerful acceptance of the trials of life was often a rebuke to his friends. His easy and graceful speech; his polished manners; his delicate regard for the feelings of others; his unostentatiousness; his interest in the little as well as the great things in life; his wit; his inexhaustible fund of anecdote; his wide culture,—all served to attract to him a large number of friends, whom he kept strongly to him.

A distinguished physician once said of him: "He is one of the most lovable men and skilful all-round physician I have ever met." This opinion is certainly shared by all those of his fellows in the medical profession who had the good fortune to know him.

It is, however, to the professional side of Dr. Rockwell's life that most attention must now be given, for this was his life's work, and in this was he brought into close contact and fellowship with us all. Our friend was born in the village of Wallatea, near Albany, in this State, December 22, 1843. Soon after his birth his parents removed with him to Wilmington, Del., and thence they brought him to Brooklyn when he was eight years of age. His father was the Rev. Edson Rockwell, D.D., who was the pastor of the Central Presbyterian Church in this city for many years, having been the immediate predecessor of the Rev. Dr. Talmage in that pulpit. Young Rockwell received his preliminary education at the Brooklyn Polytechnic Institute, and then entered Amherst College, from which he graduated in 1865, the valedictorian of his class. After graduation he at once took up the study of medicine, having as his preceptor the late Dr. Benedict, of Pacific Street. He graduated in medicine in 1868 from the College of Physicians and Surgeons of New York City. One who was his classmate at that time says of him: "As a student he was diligent and attentive, but no amount of serious work blunted his appreciation of humor; he had no little talent as a caricaturist, and some of his pencil sketches passed around the lecture room, served, if not 'to point a moral,' at least to soften the ofttime dryness of the subject before the class."

His graduating thesis, on "Hypodermic Medication," received "honorable mention" by the faculty. After graduation he spent some months in Europe, from whence he returned to take up practical work as an interne at the Kings County Hospital in Flatbush. His service here expired in the summer of 1870. At once he opened his office in the city, at the corner of Nevins and Pacific Streets. After two years' work here he removed to No. 42 Fourth Avenue, and finally, in 1875, removed to Lafayette Avenue, which for the remaining fourteen years of his life his residence remained.

In September, 1872, he was married to Elizabeth Newbridge Hammil. From this union, which was an unusually happy one, five children were born, three sons and two daughters. Both of the daughters died in early infancy; the sons all survive their father, and, with their mother, now find their home at the country, which was always such a pleasure and solace to their father.

Dr. Rockwell's professional career in Brooklyn was one of steady progress. He entered upon his work a type of the best class of medical men. Of cultured and refined parentage, with a thorough preliminary college education, he was qualified to make the most of the superior advantages which a metropolitan medical school could offer him. Then with mind broadened by foreign travel, and with experi-

ence ripened by hospital observation and drill, he needed only diligence and patience to conquer success. He made friends on every hand; he studied his cases and watched them unweariedly; no emergency found him unprepared. One by one he swept into his net professional prizes of the greatest amount, until at the time of his death he had conquered a position of professional eminence and influence unsurpassed by no one in the city of Brooklyn. He held a chair first in the Central Dispensary, and later in the out-door department of the Long Island College Hospital. His chair in the latter dispensary was a surgical one, and it had much to do with giving him the bent toward surgery in which his most conspicuous after achievements were to be made. He was for many years the attending physician to the Sheltering Arms Nursery. In 1873 he was appointed one of the surgeons to St. John's Hospital, and in 1882, one of the surgeons to St. Mary's Hospital, which positions he continued to fill up to the time of his death.

In 1874 and 1875 he served as lecturer on minor surgery in the Auxiliary Faculty of the Long Island College Hospital. In 1870 he became a member of the Kings County Medical Society, and during his long connection with it contributed many papers of value to its proceedings and occupied positions of honor in its organization. He was a permanent member of the New York State Medical Society, and was one of the founders of the American Association of Genito-Urinary Surgeons. He was prominent in the organization of the Anatomical and Surgical Society of Brooklyn in 1878, and was always interested in the work of the Pathological Society, of which he was the president in 1877 and 1879. In 1888 he was elected a member of the New York Surgical Society.

It was at his residence and largely through his influence that the Brooklyn Surgical Society was organized in 1887. He was the first president of that society.

Of the many contributions to medical literature made by Dr. Rockwell, the following are among the more important.

1876.—Notes on Cases of Traumatic Coccygodynia (Proceedings Med. Soc. Kings Co., Dec.).

1882.—Some Points in the Pathology and Treatment of Enlarged Prostate (The Pathologist, Oct., 1882).

1884.—Antiseptic Surgery in Private Practice (New York Med. Jour., May 17).

1888.—Laparotomy for Acute Intestinal Obstruction (Annals of Surgery, VII).

1888.—Removal of Both Testicles for Recurrent Carcinoma of Epididymis (Annals of Surgery, VIII).

1888.—Is the Immediate Treatment of Recent Fracture of the Patella by Wiring a Justifiable Operation? (Brooklyn Med. Jour., June).

1888.—Cerebral Abscess (New York Med. Jour., Nov. 24).

1889.—Notes on the Treatment of Hæmorrhage from Large Venous Trunks (Brooklyn Med. Jour., April).

The titles of these papers give some index of the active and progressive character of his work. He was only getting fairly started in his work when the principles of antisepsis as applied to surgical practice began to be understood. He was quick to seize them and apply them to his work, and contributed much by his advocacy and his example to establish them in the confidence of his brethren in Brooklyn. He was one of the pioneers in the revival in this city of the operation of tracheotomy for the relief of croup which signalized the years 1875 and 1876. He performed this operation for diphtheritic croup in all twenty-three times, and had the gratification of seeing five of his cases recover. In genito-urinary surgery his experience was unusually great, and his skill was signal. He was not the partisan of any set method or theory, but was ready in every case to meet the indications which his judgment pointed out to him. Urethrotomy, internal and external, with or without a guide; lithotomy, median or lateral or suprapubic; lithotritry or litholapaxy, all were procedures resorted to by him as in his judgment the particular case demanded. From no field of surgical endeavor, however, did he exclude himself. Success crowned his work in ovariectomy, in kelotomy, in nephrectomy, in laparotomy for intestinal obstruction, in extirpation of goitre, in plastic surgery of every kind as well as in the more common procedures of every-day work.

In the performance of his surgical work he was what one would expect him to be from the training and the nature we knew him to have possessed. He was cautious, yet aggressive; considerate, yet positive; skilful in his manipulations, learned in his pathology, acute in his prognostics. He was wise in counsel, firm in action, bold and ready to meet the inevitable.

It is difficult to realize that he is no longer one of us. We had watched his progressive professional development with interest, and had learned to count upon him as one who would for many years to come represent among us the best fruit of modern surgical endeavor. To an eminent degree he was a representative of the new school of medical men that our new social and scientific conditions are creating in our city. Had his life been prolonged it is easy to see that he would have done much to help on progress among us. The morning of his life was well advanced, but the full noon had not yet been

reached. While he had done much, the promise of much more to be done by him was apparent. To be cut off at such a point in his career is an irreparable loss to his professional brethren who remain, who may justly stop for a moment in their work, not only to mourn the departure of a friend and companion, and to pay the respect to his memory which his personal worth calls for, but also to consider those lessons which his premature death teaches. The early flight which has cut short the career of some of the most promising men whose names have adorned the rolls of this Society is not without its adequate cause.

Richard Cresson Stiles, whose purity of character, scientific enthusiasm and professional attainments made him a tower of strength in this community less than twenty years ago, suffered mental eclipse at the age of forty-one, and died from pneumonia at the age of forty-three.

Charles H. Giberson, than whom at the time of his death no one exerted a more commanding influence in the medical profession of Brooklyn, while in the full tide of his achieved success, lay down and died from idiopathic peritonitis when but forty-one years of age. And now our friend, Francis Warren Rockwell, who united in himself much that was best in both of these admirable characters named, falls a victim to a septic inflammation to whose rapid progress his tissues had no reactive power to oppose, at the age of forty-five years. These all have been examples of brilliant talents early consumed by too unremitting and exacting labors. Forty years of age finds most men with the ready recuperative power of youth less responsive to demands upon it; no longer may what seem to be the calls of duty or ambition be always followed with reckless ardor. Soberer and more prudent plans of life should be entertained, and the mature and judicious use of the knowledge and power already achieved should mainly be the future aim. By the time a man reaches fifty years this lesson is learned, and he has adjusted himself to his conditions. The intervening period is the critical one, during which too often some of the highest ornaments of the medical profession are lost. Such was the case with our colleague whom we now lament. The increasing magnitude of his work overwhelmed him, for into whatever he did he put a part of himself. It would be possible to recite many instances of his self-forgetfulness and devotion to duty; he had not yet learned how to deny himself to any who called for his services; he was not yet satisfied to restrict the field of his endeavor. Had he had more phlegm, or had his constitution been of a more robust cast, he might possibly have been able to endure the assaults of these critical years. But, alas, the delirium of work and the intoxication of success which drove him on had no such

safeguards to limit their exacting demands; to-day only what he did and what he was remains to us through memory.

LEWIS S. PILCHER, M.D.	} <i>Obituary Committee.</i>
THOS. R. FRENCH, M.D.	
WM. E. GRIFFITHS, M.D.	

RESOLUTIONS OF BROOKLYN PATHOLOGICAL SOCIETY ON THE DEATH OF DR. F. W. ROCKWELL.

Your committee appointed for the purpose of preparing suitable resolutions concerning the death of Dr. Rockwell respectfully submit the following:

Whereas, We learn with the most profound regret of the death of our distinguished associate, Dr. Frank W. Rockwell, an honored member of the medical profession, whose valuable contributions to its literature, and whose life among us during a number of years had endeared him to us, and has contributed largely to the good standing and elevation of the profession. And

Whereas, By the death of Dr. Rockwell the Brooklyn Pathological Society has sustained an irreparable loss, the medical profession been deprived of one of its most skilful physicians and surgeons, and the entire community of a true, honorable and benevolent gentleman. Therefore be it

Resolved, We beg the privilege of offering to his bereft family our testimonial to his unstained reputation as a physician, surgeon, high-minded gentleman, a devoted husband and father; and with it our deepest sympathy in their great affliction.

Resolved, That the foregoing be incorporated in the minutes of the Society, and a duly authenticated copy be presented to the family.

R. G. ECCLES,	} <i>Committee.</i>
W. J. CRUIKSHANK,	

OBITUARY.

Henry J. Menninger, M.D., died in this city, September 8th. He was a native of Germany, but came to this country while young, and was educated in New York. He graduated in 1863 at the University Medical College. He soon after entered the medical corps of the army and served until 1868. From 1865 to 1868 he was surgeon-in-chief to the Marine Hospital at Newbern, N. C. He left North Carolina about 1874 and settled in Brooklyn. He served the city as alderman, and the county as coroner, and filled both positions with honor to himself and to the profession of which he was a member.

THE BROOKLYN MEDICAL JOURNAL.

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EDITORIAL.

THE TIMES AND REGISTER.

The Editor of *The Times and Register*, to which journal we recently referred as being the outcome of a union of several Philadelphia journals, desires us to call the attention of our readers to the fact that the attacks made upon that journal as being organized to form a "medical journal trust," and as being under the control of manufacturers or patent medicine houses, are without foundation. We take great pleasure in making this announcement, for the reputation of a medical journal should be as much beyond reproach as that of the men under whose editorial management it is conducted.

SULPHUR FUMIGATION.

The communication of our correspondent on the subject of sulphur fumigation, published in the July number of the JOURNAL, directs attention to a very important subject. In his family, after carrying out faithfully the instructions of his physician as to fumigation, two other cases of scarlet fever occurred. Inasmuch as two important rules were violated in this instance, the inefficacy of sulphur fumigation to prevent contagious disease must not be considered as demonstrated by this case alone. The two rules referred to are:

1. That at least three pounds of sulphur should be burned in every thousand cubic feet of air-space to be fumigated; and,

2. That the sulphur should be burned in the presence of moisture.

The first of these rules has been insisted upon over and over again. The second rule has not been even mentioned in the rules for disinfection prescribed by most boards of health. Dr. E. R. Squibb, in a

paper recently read before the Kings County Medical Association, refers especially to this defect. He says that moisture is necessary to enable contagious matter to propagate contagion, and *equally necessary for any reaction with agents which have the power to so change their molecular structure as to destroy their capacity for contagion*. He shows that sulphur dioxide, resulting from burning sulphur in the air, is not a disinfectant, but requires the presence of moisture; and that in proportion to the amount of moisture, up to what would be a very large dilution, the more there is present the more perfect are the conditions for thorough disinfection, and the less moisture there is present the more imperfect the disinfection.

Dr. Sternberg's experiments, made in 1880 and 1881, demonstrated that to destroy the power of *liquid* vaccine five grammes of sulphur burned in a cubic metre of air were sufficient, while to destroy *dry* vaccine sixteen grammes per cubic metre were required.

In writing on the subject of sulphur fumigation, in a recent report, Dr. Chapin, Superintendent of Health of Providence, says that in one hundred and fourteen cases of scarlet fever in which this method of disinfection was practiced as well as it could be in a private house, the disease extended beyond the family where it first appeared to others in the house ten times. This was less often than when fumigation was not done, the ratio then being one to four, and in the latter case one to eleven. He believes that isolation, disinfection of soiled linen, and thorough inunction of the patient, have as much or more to do with the restriction of the disease than does the final fumigation.

That there is a growing tendency to abandon the fumigation by sulphur of premises infected by contagious diseases, or at least not to depend upon it alone to the exclusion of other means of disinfection, cannot be denied. Writing on this point, Dr. Squibb says that he has reached the conclusion that burning sulphur for disinfection should by no means be abandoned, but should be more thoroughly and more carefully applied. He says that a shallow pan of water upon a kerosene stove well started in advance of lighting the sulphur, and the floor, ceiling, and walls well sprinkled with water by means of an ordinary dust-brush, is perhaps as good a practice as any.

Dr. Sternberg says that, admitting that in the absence of spores, micro-organisms suspended in the atmosphere or attached to the surface of objects may be destroyed by sulphur dioxide, when generated in a sufficient quantity in a well-closed apartment and in the presence of moisture, the question remains whether the same object may not be as well accomplished by thorough ventilation, and by washing all surfaces—walls, ceilings, floors, furniture, etc.—with a 1 : 1000 solution of mercuric chloride, which we know to be promptly destructive of germs of all kinds.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

Subjects for October meeting (Oct. 15th):

Report of Committee on Surgery; "Anatomical Landmarks and Operative Technique of Strangulated Hernia," by E. A. Lewis, M.D.; "Some Points on the Reduction of Hernia," by Jarvis S. Wight, M.D.; "The Question of the Radical Cure of Hernia from its Present Aspect," by George R. Fowler, M.D.

MEDICAL MICROSCOPICAL SOCIETY OF BROOKLYN.

The twenty-third regular meeting of this society was held May 1, 1889, at the Hoagland Laboratory, with the President, Dr. Heitzmann, in the chair. After disposal of the regular business of the society, Dr. Weeks, of New York, read an interesting paper on the "Microscopical Appearances of the Tissues of the Eye in Glaucoma," of which the following is a brief abstract. The disease under consideration depends for its essential feature on a symptom, *i. e.*, an increase in the intra-ocular tension, which occurs under very varied circumstances. Glaucoma may be divided into two great classes:

I. Primary or idiopathic, which is recognized as the type of the disease.

II. Secondary or consecutive.

Primary glaucoma may extend over many years, unaccompanied with severe pain, and gradually produce complete blindness; it may manifest itself by repeated severe attacks, each attack leaving the vision a little more impaired, or it may consist of one long subacute or acute attack in which the pain is more or less constant and prominent. Secondary glaucoma includes those cases which follow some determinable predisposing cause, as after traumatism, corneal ulcer with iritis, degeneration of the walls of the intra-ocular vessels, intra-ocular tumors, etc. In acute attacks haziness of the cornea, shallow anterior chamber, dilatation and sluggishness of the pupil, pain in eye and temple, and great diminution of vision are prominent symptoms. Widely different theories regarding the etiology of glaucoma have been advanced by Graefe, Donders, Bowman, Priestly Smith, Weber, Brailey and others, of which that of Weber, which simply designates more or less complete closure of the lymph spaces in the iris angle from whatever cause, thus forming a

barrier to the ready escape of intra-ocular fluids, is the only one that explains all of the conditions met with.

It is conceded by all recent investigators that the fluids of the vitreous and aqueous are secreted by the ciliary processes, and possibly in small part by the iris. The experiments of Knies, Weiss and Smith show conclusively that the chief avenue of escape for the fluid from the vitreous and aqueous chambers is by the iris angle, notwithstanding the statement by Angelucci that a large portion of the fluid from the vitreous escapes by the perivascular lymph spaces, or the experiments of Stilling, Deutschmann and others, tending to show the filtration of liquids from the vitreous by way of the optic nerve and subvaginal space. Cupping of the optic disc is a relatively late condition in glaucoma.

The changes met with in the tissues of the eye in glaucoma are of the most varied kind. The haziness of the cornea observed in conditions of high tension is probably due to œdema of the cornea, the epithelial layer being rendered uneven by the presence (as Knies has demonstrated) of small collections of fluid beneath and between the cells. As shown in the specimens, the cornea is often much enlarged, as in buphthalmus and in total staphyloma in which the sclerotic is implicated. Bowman's membrane becomes changed in some cases into a layer of connective tissue in which blood-vessels are sometimes found. Descemet's membrane and the endothelial layer remain intact in primary glaucoma, also in secondary, if not implicated in some corneal lesion or process. In younger subjects the sclera often becomes much thinned, and staphylomata form; in others the sclera remains unchanged, so far as microscopical examination can determine. The theory of simple sclerosis of the sclera as the cause of glaucoma has little foundation in fact. The iris, ciliary body and processes become somewhat enlarged in the early stages of glaucoma, but soon pass into an atrophic condition in which the iris may be reduced to little more than the pigment layer. It is usually found adherent to the cornea at the iris angle, closing the spaces of Fontana, and may be totally adherent to the cornea. Atrophy of the choroid in all its stages is observed in glaucoma. Degeneration of the retina from the mildest to the most advanced degree is also seen. In hæmorrhagic glaucoma a fibro-hyaline degeneration of the walls of the vessels, both of the retina and of the vascular tunic (most marked in the arteries) is present, often reaching a very high degree in the retina. Obliteration of the lumen of arteries and extensive hæmorrhage into the retina and chambers of the eye are met with. Detachment of the retina with subretinal exudation is not incompatible with an increase of intra-ocular tension. Cupping of the optic disc is probably always present in the advanced stages of glaucoma. It includes the whole of the area of the lamina cribrosa, and is a demonstration of the giving way of the

weakest part of the fibrous tunic. In cases of total detachment of the retina the cupping may be made out by the position of the lamina cribrosa. The optic nerve becomes atrophic, connective tissue taking the place of the nerve fibre bundles.

Dr. Week's paper was illustrated with numerous carefully prepared sections, and was quite fully discussed by Drs. Prout, Heitzmann, Fearn, Kemp, and Weeks.

Dr. Kemp then read by invitation a paper on the "Histology of the Coagulation of the Blood." Human blood contains three kinds of corpuscles, the ordinary red corpuscles, the white corpuscles or leucocytes, and lastly "plaques" or "plates." These plaques are about one-third the size of the red corpuscles, resembling them in their biconcave shape and rounded margins, but containing no hæmoglobin. Dr. Kemp had studied them in blood drawn into various preservative fluids from a prick in the finger. When coagulation of the blood occurs, the ordinary red and white corpuscles retain their integrity, whereas the plaques lose their smooth outlines, become crenated and granular, and fuse together till their identity is lost and they form mulberry-like masses which usually form nodes of thickening for the fibrin threads. Anything which prevents the breaking down of these plaques prevents coagulation. A study of the blood at low temperatures, so that the coagulation may be very slow, shows no appearance of fibrin until the plaques have become granular. Treatment of the plaques at this stage with iodine often reveals a faint hyaline substance surrounding them, as though something had been given off from them, leaving the granules behind. The nature of this hyaline substance is not yet positively known.

Dr. Kemp spoke of Schmidt's theory of blood coagulation, and expressed his belief that the white corpuscles do not break down, and that the fibrin ferment necessary for coagulation comes not from them but possibly from the plaques. In leucæmic blood many of the white corpuscles are not apparently healthy, but they do not break down during coagulation any more than do the normal white corpuscles. In frogs, fishes, etc., whenever the red corpuscles are nucleated, the plaques are also nucleated. In frogs they are pear or spindle shaped, with a large nucleus, and their first change in coagulation is to become round, thus becoming hard to distinguish from leucocytes, which however do not break down. In some of the lower animals the white corpuscles do throw out branches, and thus contribute in the formation of the clot. The appearances and changes above described were amply illustrated by admirably taken photo-micrographs of coagulating blood.

Dr. Kemp's paper was then discussed by Drs. Heitzmann, Eccles, and Kemp, and there being no further business the society adjourned.

RICHMOND LENNOX, *Rec., Sec'ry.*

KINGS COUNTY PHARMACEUTICAL SOCIETY.

The regular meeting of this society for September was held on Tuesday the 10th inst., Vice-President presiding in the absence of President Davis, detained by illness. A very able paper was read by Mr. Luther F. Stevens on "Citrate of Magnesia," and those not present missed a rare treat.

Mr. A. M. Redmond, of No. 392 Gates Avenue, was elected to membership.

The death of Dr. Henry J. Menninger, one of the founders of our society, was feelingly alluded to by Mr. DeForest. The death also of Mr. J. N. Brandenburg, a recent member, was announced, and the customary action taken in each case.

After some discussion of the paper of Mr. Stevens by Messrs. DeForest and Sayre, the society adjourned.

F. N. BLISS, *Secretary*.

THE PUPIL AS A GUIDE IN THE ADMINISTRATION
OF CHLOROFORM.

As a result of experiments upon animals and of observations made upon man, Dr. H. I. Neilson formulates the following conclusions: 1. The first effect of chloroform narcosis on the pupils consists in a dilatation which varies in intensity and duration in different individuals. As the anæsthesia becomes more profound the pupils then begin to contract, and finally become very small and immovable. If now the chloroform is pushed still further, a sudden dilatation occurs, which is the result of asphyxia, from which the patient seldom recovers; 2. As long as the pupil is observed to dilate in response to sensory stimuli, such as pinching the skin, the anæsthesia is not yet sufficient to allow the commencement of the operation; 3. As soon as the pupil becomes strongly contracted and immovable the administration of the anæsthetic must be suspended until a commencing dilatation is observed, and the patient must be held at just this point as long as the operation continues; 4. Vomiting causes a dilatation similar to that occurring as the patient emerges from the narcotic condition, but it is usually more sudden in the former case. In experiments upon dogs it was found that the contraction of the pupils did not begin until the blood-pressure was somewhat reduced, and that the dilatation proceeded *pari passu* with the increase in the blood-pressure. The author regards the appearance of the pupil as a very reliable guide for the administration of chloroform, as by it he is enabled to judge accurately concerning the condition of the patient.

—*La Riforma Medica*.

PROGRESS IN MEDICINE.

PRACTICE OF MEDICINE.

BY HENRY CONKLING, M.D.,

Pathologist and Assistant Visiting Physician to St. Peter's Hospital; Physician to the City Dispensary.

THE HEART AND BLOOD VESSELS.

The Chief Factor in the Causation of Cardiac Strain.—Dr. Julius Sommerbrodt (Berlin klin. Wochensch., 1889) writes that a dicrotic or hyperdicrotic pulse, after severe exertion, is caused by increased respiration, and that it may persist for some time. This is explained by assuming that the sensory nerves of the lungs are excited, owing to an increase of intra-bronchial pressure. This sensory excitation has a reflex action upon the cardiac inhibitory nerves, and also a reflex depressing influence upon the vaso-motor nerves. All observers are unanimous in agreeing that severe exertion increases arterial blood pressure, and thereby throws more work upon the heart. It is true, however, that many people over-exert themselves with no ill effect. The author therefore recognizes two factors:

I. The rise of arterial blood pressure.

II. The provision for its compensation.

He thus describes the compensation (necessary to combat the ill effects of the increased tension):

1. All muscular activity causes an increase of CO_2 and a diminution of O in the blood.

2. The increase of CO_2 in the blood so influences the innervation of the lungs that the breathing becomes deeper and quicker.

3. Such breathing increases the intra-bronchial pressure.

4. This causes irritation of the sensory nerves of the lungs.

5. A reflex depressant action on the vaso-motor nerves, causing relaxation of the walls of the vessels.

6. This relaxation of the vessel walls lowers the arterial blood pressure.

In this way the ill effects of strain are guarded against.

The author furthermore divides strains into three groups:

1. Overlifting.

2. Fatiguing marches under heavy loads, and strenuous labor in a cramped attitude,

3. Strenuous exertion in old age.

Overlifting may cause sudden aortic insufficiency, aortic rupture, or lead to chronic dilatation of the left ventricle with irregular action. During a very strenuous bodily effort, after breathing deeply, the breath

is held, *i. e.*, the thorax is fixed in the inspiratory position. Here there is no rise of intra-bronchial pressure; hence no irritation of the pulmonary sensory nerves, and no reflex action on the vessels to cause relaxation. In this condition there is of course a diminution in the flow of venous blood to the thorax.

In the second group it is evident that, when marching under a heavy load, especially uphill, the weight is carried high between the shoulders, the body is bent, the thorax is fixed, the abdominal muscles rigid, and thus respiration becomes superficial. Tight lacing is a potent cause in females; and when rapid dancing is persisted in under the influence of excitement, the strain upon the heart is very severe; hence fainting is not uncommon.

The third kind of work often injurious to the heart is work done by those advanced in years. When such a man ascends a mountain the breathing is quickened and the intra-bronchial pressure is increased. The reflex action on the heart causes quickened action, and the reflex action upon the vaso-motor nerves tends to cause vascular dilatation. In such a case a probable atheromatous condition of the vessels, preventing this dilatation, makes an additional peril in such work to old people.

Conclusion.—The chief factor in the causation of overwork of the heart is the abolition of the natural compensatory provision against injury to the heart. If this provision be in full play, and the heart be healthy, strenuous exertion is undergone without much strain.

DISAPPEARANCE OF CARDIAC MURMURS.

Boyd (Med. Press, Dublin, March, 1889,) gives a few notes on the disappearance of cardiac murmurs which have existed sufficiently long and have *led to such changes in the cardiac walls* as to be considered organic in character. Such murmurs are generally consecutive to acute rheumatic endocarditis. Cases also occur of chronic endocardial changes which ultimately leave the heart free from all traces of disease. Three cases are recorded. In one the murmur of mitral regurgitation was present, with consecutive changes in the auricular and ventricular walls. This condition had existed for two years. This murmur disappeared, *as did the hypertrophy and dilatation*. The other cases were both of aortic regurgitation. In them the hypertrophy and dilatation of the ventricle might be taken as sufficient evidence that they were of a permanent nature, and also their duration after the primary endocarditis. The author maintains that a well established constrictive murmur never gets well. It may disappear or cease to be heard, owing to failure or weakness of the cardiac walls, or to excessive dilatation of them, or of the aorta, *but the symptoms associated with it remain*. Plastic material deposited in or on the valves may ultimately be

absorbed, but when deposited around the margin of an orifice must soon cause obstruction by contraction.

[NOTE.—In the above extract the sentences in italics have been so printed, as they give, in our opinion, evidence of the great value of the paper. Nowhere is a murmur spoken of alone. Mention is always made of the changes in the cardiac muscle due to inflammation. Cardiac murmurs in and of themselves mean nothing. They are interesting to study as regards time, position, rhythm, and transmission. To use them as diagnostic of cardiac disease must lead to grave errors. The symptoms and signs which accompany them are of greater value. The author, in recognizing this and in so recording his cases, has given testimony of the utmost value, which becomes a welcome addition to that already collected, that organic cardiac disease, chronic in its nature, may pass away and leave a healthy organ.—H. C.]

THROMBOSIS OF AORTA.

Pitt (*Br. Med. Journal*, May 21, 1889,) records a case in which the transverse and descending portions of the aorta contained a large flat firmly adherent decolorized ante-mortem clot, which was broken down in the centre. The hæmal surface of the clot was smooth; its length was five inches, and there was a mass depending from it which probably had formed shortly before death. The aortic wall was atheromatous. The case was that of a man aged fifty-six, who had undergone a severe surgical operation, dying a few days after. During life there were no symptoms to indicate the local vascular trouble. Small masses of blood or atheromatous patches are not uncommon, but a thrombus of such size is, as far as recorded cases show, of rare occurrence.

CARDIAC-VASCULAR NUTRITION, AND CARDIAC DISEASE.

Centblt. (f. klin. med., 1889,) gives two interesting contributions relating to the pathological anatomy of diseases of the walls of the heart. The first is an analysis of seventeen cases of the condition known as arterio-sclerosis of the heart, in which in the generality of cases hypertrophy and dilatation were found secondary to the vascular disease which caused the parietal sclerosis. There are three forms of cardiac sclerosis:

1. Circumvascular, from inflammation.
2. Dystrophic, from local ischæmia
3. Mixed.

All of these changes cause poor nutrition and may lead to amyloid degeneration.

The second contribution relates to the effects of the obliteration of the coronary arteries on the nutrition of the heart. The coronary cir-

culation may be arrested either slowly or suddenly. If suddenly, as by acute aortitis, embolism, or thrombosis (from endocarditis), the arrest may cause rapid degeneration, infarction, softening of the myocardium, and rupture. If slowly, as from atheroma of the coronary arteries, the arrest may produce, in addition to the changes enumerated, cardiac aneurism.

The severity of these conditions may be modified by supplemental coronary arteries which accompany more especially the posterior coronary artery running mostly in the upper part of the ventricles. The author surmises that these supplemental vessels may be the cause of the infrequency of angina pectoris compared with the relative frequency of the disease (of the coronary arteries) to which it is attributed.

THE PREVALENCE, CAUSATION AND TREATMENT OF ACUTE CARDIAC AFFECTIONS.

Cox (Med. Press, Dublin, May, 1889), in a paper under the above heading, deals especially with acute endo- and pericarditis. Among other varieties he describes that which he calls rheumatic in origin. He regards acute endocarditis as one of the most common of acute constitutional diseases, and in his own experience more prevalent than acute pleurisy or acute pneumonia. He has found in these rheumatic cases that the heart affection occurs regardless of rise of temperature, being often unattended by pyrexia, and to be more often in indirect, rather than direct, ratio to the joint trouble. A favorable view is taken as to the curability of rheumatic heart affections. A large number of recoveries are recorded. The causation of these acute affections is the same as the causation of rheumatic fever. This the author regards as a *neurosis*—a disturbance of the trophic centre or centres which control alike heart and joints. By such means he considers it possible to understand the sudden implication and recovery of joints. The presence of these centres, with the further presence of a thermo-taxic centre, makes intelligible the beneficial action of blisters over the affected heart.

The author regards rest, long continued, as of great value. The rheumatic fever is treated on the usual plan. Blisters, again and again repeated, over the heart, are to be used. Internally the perchloride of mercury with iodide of potassium, digitalis, and nux vomica are useful. The mercury and iodide may be continued for months. He regards pepsin as a valuable aid when using the two drugs for any length of time. The tincture of iron may be used in cases of great cardiac debility. In apyrexial cases, salicin, salicylic acid, and salicylate of soda are considered as harmful.

CAUSATION OF MITRAL DIASTOLIC MURMURS.

Rollerton (St. Bartholomew's Hosp. Reports, 1888) defines this murmur as one characteristic of mitral obstruction, occurring during

the ventricular diastole. As far as time goes, there may be four murmurs :

- I. A long murmur, occupying the whole of diastole.
- II. A murmur occurring with the second sound—early diastolic.
- III. A murmur near the middle of diastole—mid diastolic.
- IV. Præsystolic or late diastolic.

The causation of the second and third are discussed.

The author quotes Balfour, who has objected to calling the auricular systole as the cause of the second murmur, since, as he points out, the interval of silence between the soft diastolic mitral murmur and the rough præsystolic murmur is against the theory that, but are explained by a continually contracting auricle. Balfour has explained the early and mid diastolic murmur as due to blood running into the ventricle through the constricted mitral orifice, the propelling force being one acting *a tergo*, viz.: the high tension in the pulmonary system, as shown by the reduplicated and accentuated second sound. The author also objects to Fagge's theory that the auricular systole, under these conditions, commences earlier than normal, and ends some little time before the ventricular systole.

He thinks, however, that a very evident cause for these murmurs is the fluid vein, produced at the commencement of diastole by the negative pressure produced in the left ventricle by the elastic expansion of its muscular walls after their forcible systole. In a healthy heart the suction-pump action of the left ventricle draws the blood into the ventricle at the commencement of the diastole, but no fluid vein or murmur is produced. But when the blood has to pass through a contracted mitral valve, an eddy results, which is often palpable as a thrill and audible as a murmur at the commencement or middle of diastole.

In health the ventricle is filled at first by blood sucked into it by the vis a fronte of the negative pressure developed in its cavity; while towards the end of diastole the blood in the auricle is driven into the ventricle by the vis a tergo of the auricular systole. With a contracted mitral orifice, the left auricle is distended with blood at a higher pressure than normal. When the left ventricle expands there are the conditions most favorable for the formation of a fluid vein, viz., blood passing at fairly high tension through a narrow orifice into a large cavity—the constricted mitral valve and the expanded left ventricle.

It is also submitted that while the præsystolic is due to the *vis a tergo* of the auricular systole, the early and mid diastolic murmurs result from the *vis a fronte* of the expanding left ventricle and its suction-pump action. The author concludes by saying that an entire diastolic murmur is due, its early part to the negative pressure in the ventricle, its later part to the contraction of the left anricle.

OBSTETRICS.

BY CHARLES JEWETT, M.D.

PUERPERAL WOUND INFECTION.

Bumm (Arch. f. Gyn., B. xxxiv., H. 3). That puerperal fever is wound fever, and that wound fever is wound infection, all physicians in Germany are agreed. Beyond this point much difference of opinion obtains with reference to the etiology of childbed fever. The recognition of two forms of fever, septic infection due to the invasion of the living tissues by pathogenic organisms, and putrid intoxication from the absorption of the chemical products of putrefaction, is an important advance in our knowledge of the subject. Uncomplicated cases of putrid intoxication are frequent. Bits of placental tissue, shreds of membrane, clots, etc., furnish the putrefactive material. Putrefactive products constitute the toxic agent. Every rise of temperature means a new arrival of putrilage in the circulation. There is no multiplication of germs in the tissues. The fever continues only so long as the supply is maintained. Cleanse the uterus, the supply is cut off and the fever ceases. With reference to the method by which the germs of putrefaction gain access to the uterine cavity, the writer dissents from the views of Winter. He thinks the power of locomotion is wanting in case of most micro-organisms, and in others too limited to account for their migration over long distances. They do not go much farther than they are carried by mechanical means. For the most part they are kept out of the uterine cavity by the downward current of secretions which is concentrated at the narrow point, the os internum. In most cases of putrid invasion of the cavity of the uterus the micro-organisms are carried on the fingers or instruments. Membranous shreds which hang down into the vagina may serve as the means of carrying the putrilage; or the germ-laden secretions of the cervix may regurgitate into the uterine cavity.

Precisely what micro-organisms accompany putrid decomposition has not yet been fully determined. Certain it is that there are not often to be found in the vaginal and cervical secretions microbes capable of setting up active decomposition in albumen, and yielding toxic products.

As to the avenues of absorption, it is well known that the uterine mucosa absorbs rapidly, the vagina slowly when intact. To what extent the blood-vessels are concerned, and to what extent the lymphatics, is not yet known.

On the question whether putrid intoxication can lead to septic infection, the writer says the occurrence of mixed cases of sapræmia and septicæmia is not doubtful. Clinically, well-established bacterial

invasion and intoxication symptoms are frequently combined in the same case. What influence putrid material primarily present in the genital canal may exert in promoting septic invasion, is an important question as bearing upon the possibility of so called self-infection. In attempting to answer the question, several considerations must be borne in mind. The bacterial flora of the genital tract is doubtless modified by changes in the culture medium. Other micro-organisms thrive in catarrhal than in normal secretions; still others, again, in the lochial fluid. Decomposing lochia are doubtless a better culture medium for wound infection germs than the normal secretions are. Of two cases of sapræmic intoxication from retained secundines, in which no interference had been practiced, the writer found the streptococcus pyogenes in the uterus of one and no specific germs in the other.

One way in which putrid intoxication may lead to sepsis is through its influence in lowering the normal resisting power of the tissues. It is conceivable that putrefaction may in this way, too, favor sepsis from the pathogenic organisms known to be present in a certain proportion of cases in the lower portion of the genital tract in a non-virulent condition.

The author turns next to the bacteria of the infectious form of puerperal fever. It is important to distinguish clearly between these organisms and those of putrid decomposition. The latter, unlike the former, are incapable of attacking living tissues. The micro-organisms which cause the infectious forms of puerperal fever are almost exclusively the chain cocci. The chain coccus of puerperal fever is identical with the streptococcus of ordinary wound infection. No difference can be shown either by the microscope or by culture tests. The resorption activity, or other conditions peculiar to the puerperal patient, may modify the sickness; but the more infectious and graver form of childbed fever is a streptococcus invasion. The differentiation of streptococci into streptococcus erysipelatos and streptococcus pyogenes is merely artificial.

Between the streptococcus of phlegmon, of puerperal fever, and that of true erysipelas, no morphological or biological difference exists. This the author thinks established by his own and many other inoculation tests. Diphtheria and scarlet fever are liable to cause childbed fever only through a secondary streptococcus invasion.

INVOLUTION OF THE PUERPERAL UTERUS.

Saenger (Nouv. arch. d'obstet et de gyn., Mai, 1889,) says if the old theory which attributes the involution of the puerperal uterus to the fatty degeneration of its fibres be true, union of the uterine wound after Cæsarean section would be impossible. He regards the theory of fatty degeneration, therefore, as fallacious. He has examined the

muscular fibres of seventeen uteri hardened in alcohol. A portion of them were from non gravid and a part from puerperal women confined at different periods of gestation. The bundles of muscular fibre were separated by means of a weak solution of nitric acid. The length and breadth of the bundles were all different. During pregnancy they were very much lengthened and broadened. After confinement lengthening and broadening disappear. But while diminution takes place, particularly in the third week after confinement, at the beginning during the first hours following birth the bundles broaden and shorten. These changes correspond to the contractions of the uterus after confinement. In the transformation fat may be produced outside the muscular fibre, and the proof is the occurrence of fatty embolism. We find it only in the intervals between the muscular bundles. There is, then, during involution neither disappearance of muscular fibres nor new formation. The muscular tissues are transformed in a manner which might be termed paratrophic. The uterus of a parous woman is heavier than that of a nullipara, for the reason that its tissues have not all gone back to their primitive condition. If the fœtus succumbs the transformation of the muscular structure takes place before the birth of the child. Saenger has observed it in a bicorni uterus in which a fœtus had developed in one horn and died at the seventh month. Although delivery had been impossible, the muscular bundles after the death of the ovum were found to have resumed their natural dimensions. Subinvolution of the uterus is then a fault of nutrition due sometimes to inflammation. The puerperal atrophy of the uterus is the result of an exaggerated regression of the muscular fibres and of the conjunctive tissues. The amenorrhœa and the oligomenorrhœa are the results thereof.

ROLE OF THE PLACENTA IN FŒTAL PATHOGENY.

Romeo (*Nouv. arch. d'obstet. et de gyn.*, Mai, 1889,) starting from the fact that pregnant women often transmit their maladies to the fœtus, the author has attempted to determine by experimental methods whether the placenta acts as a filter and prevents the passage of the elements which are considered as the cause of the malady. After a very interesting study of the structure of the placenta the author relates a series of experiments which he has made by injecting into the circulation of gravid animals different substances in order to see if they would be found again in the circulation of the fœtus. He arrives at the following conclusions:

- 1st. In the physiological condition the placenta constitutes an insurmountable barrier to the passage of foreign elements which circulate in the maternal blood. In other words, the placenta is a true filter.

2d. In case these elements gather in the placental lacunæ and provoke an inflammation or any other lesion capable of destroying the villousities, the barrier is then crossed by the pathogenic elements. Micro-organisms may thus pass from the maternal to the foetal circulation, carrying to the foetus the malady of the mother.

3d. If these pathogenic micro-organisms, for reasons which we do not know, are incapable of gathering in the placental lacunæ, or if accumulating there they are incapable of causing in the tissues of the placenta any lesions, their passage from the maternal blood into that of the foetus does not take place, and the product of conception remains free from all diseases of the mother.

CÆSAREAN SECTION.

Champneys (The Lancet, April 13, 1889,) reported to the Obstetrical Society of London a case of Cæsarean section by the method of Saenger. The patient was a dwarf, with a generally contracted flat pelvis. The true conjugate measured one and three-quarter inches. The ovaries were not removed, but the patient was sterilized by tying both tubes. The patient made a smooth recovery.

In the course of the discussion Dr. Herman objected to eventration of the uterus in Cæsarean section. As the ovaries were rendered useless by ligation of the tubes and might become diseased, he thought they should have been removed. Doran regarded the complete removal of the appendages as safer than transfixion of the broad ligament and ligation of the tubes. Dr. Heywood Smith thought Porro would have been the better operation for the double purpose of delivery and sterilization, and safer than the procedure adopted.

Dr. Galabin had believed that the Saenger operation was always to be preferred unless the uterus was damaged. Yet recent statistics published by Dr. Harris proved that the record of the last four years shows a mortality of nineteen per cent. for the Porro operation and of more than twenty-six per cent. for the Saenger. The Porro had succeeded better in England. He would, nevertheless, prefer Saenger as a primary choice, but he thought these figures indicated that under certain circumstances much might be said for the other alternative.

ECTOPIC GESTATION.

Tait, (Br. Gyn. Jour., May, 1889.) At the January meeting of the Br. Gyn. Soc., Mr. Tait reported a case of extra uterine pregnancy in which he had operated a few days before. The patient had been ill and in considerable pain for some weeks. The character of the tumors was not suspected till the abdomen was opened. Though menstruation had been suspended for three months, the fact was not

learned till after the operation. A five months' fœtus was found which had evidently been dead but a short time. The broad ligament had ruptured, and the placenta had set up secondary attachments to the back of the ligament and to the intestines. Fœtus and placenta were removed and the patient made an uninterrupted recovery. As the ligature only increased the hæmorrhage, the bleeding was controlled by mopping the seat of placental attachment with the perchloride of iron.

He remarked that the salient point and the one unsolved problem in the operative treatment of advanced ectopic pregnancy was the management of the placenta. The plan pursued by Dr. Champneys in one case at the St. George's Hospital of injecting the placenta with an antiseptic and leaving it seemed to be a good one, but the surgeon should stand ready to remove it by secondary operation on the occurrence of suppuration. He thought, however, that with the modern appliances for arresting hæmorrhage there need be no fear of removing it primarily, and that he thought perhaps the safer plan. His experience with hæmorrhage in the abdominal cavity in this and other conditions favored the use of the perchloride of iron as a hæmostatic. He rubbed it vigorously over the bleeding surface, washed out the loose perchloride, and put in a drainage tube. One advantage of the iron styptic was that it left so thin a film. He had been too well satisfied with iron to try the tincture of matico which had been mentioned in the discussion by Dr. Heywood Smith.

The fœtus in the case reported was malformed, having no arm on one side and only one finger representing the whole limb on the other. This was the only deformed fœtus he had met in all his experience with extra-uterine pregnancy.

On the request of the President to define what course he really pursued in the treatment of extra-uterine gestation, he stated that at the time of the primary rupture (rupture of the tube) the risks were so great that immediate interference was demanded. If, however, the pregnancy had gone on after the date of rupture and threatened no risks to the mother, there was no ground for interference at all until the viable time.

In course of the discussion Mr. Bantock favored the plan of immediate removal of the placenta, and the use of matico or the perchloride of iron as a hæmostatic.

(*Ibid.*) Dr. Edis reported a case of intraligamentous pregnancy, in which he had operated at about the fifth month in consequence of obstruction of the bowel from pressure of the child's head upon the rectum. The extra-uterine pregnancy starting in September was followed by an intrauterine gestation early in October. The patient was

extremely emaciated, owing to persistent vomiting. The placenta was left intact, the edges of the cyst stitched to the abdominal wound and its cavity irrigated and drained. The patient was doing well in spite of a fæcal fistula. Symptoms of abortion followed the operation for the first few hours, but subsequently passed off, and all promised well.

Dr. Edis exhibited a specimen from another case, in which he had operated at about the tenth week owing to rupture into the peritoneal cavity. The last menstruation had occurred December 2, 1888. The patient was perfectly well till January 14, 1889, when she experienced a sudden attack of excruciating pain in the right iliac fossa, attended with partial collapse. A sanguineous discharge from the vagina began on the following day. Another and severe attack occurred on the 20th of January after slight exertion, was repeated on the 21st with a rigor, and again on the 9th of February, the patient becoming blanched and cold. Hæmorrhage from the vagina continued from the first painful paroxysm till the date of operation. When first seen by Dr. Edis, on the 5th of February, a tense cystic mass of the size of a hen's egg was detected, by conjoined manipulation, at the right of the uterus. The uterus was enlarged, anteflexed, and pushed to the left. A diagnosis was made of tubal pregnancy. The abdomen was found, on incision, to be filled with blood. The right fallopian tube was enlarged to the size of a walnut by a gestation cyst which had ruptured. Blood was exuding from the abdominal orifice of the tube itself. The mass felt in the bimanual examination proved to be an ovarian cyst.

PELVIC MEASUREMENTS.

Pershing (*Am. Jour. Med. Sci.*, vol. xcvi., No. 2). The successful treatment of labor in narrow pelvis depends largely upon early recognition of the deformity. To this end a greater familiarity with methods of pelvic measurement is required than commonly obtains among obstetric practitioners. Special apparatus is not indispensable. A mechanic's calipers and a carpenter's rule or tape measure will serve in default of a regular pelvimeter. The external conjugate is more useful than is commonly conceded in determining the capacity of the pelvis. While the difference between the external and the true conjugate varies between 7 cm. and 12.5 cm., the difference in a given case may be estimated with comparative accuracy. The value of the true may be ascertained from the external conjugate with greater certainty, the author believes, than by any other method. With an external conjugate of less than 16 cm. ($6\frac{1}{2}$ "), shortening of the true conjugate is certain. Above 21.5 cm. ($8\frac{1}{2}$ ") contraction may be excluded.

The distance between the iliac spines (sp. il.), measured from the outer margins of the sartorius tendon, averages 27.2 cm. ($10\frac{11}{16}$ ").

The greatest diameter of the iliac crests (cr. il.) averages 29.5 cm. $11\frac{9}{16}$ ". Making allowance for the soft parts, these measurements approximate respectively 10" and 11". With due care, the value of the sp. il. is a reliable means of estimating the transverse diameter of the pelvis. A very small or reversed difference between these two iliac diameters is a strong indication of flattened pelvis.

Errors in measuring the diagonal conjugate come most frequently from not accurately marking the anterior point. The average difference between the diagonal and the true conjugate is $\frac{3}{4}$ ". This is near enough to the true average for all practical purposes, but must be varied for individual cases according to the depth of the symphysis and the value of the conjugato-symphysial angle.

In conclusion, the author submits that the pelvis should be measured not merely in rare cases, but in all women about to be confined. The external conjugate, the sp. il. and cr. il., are generally sufficient to determine whether or not the pelvis is ample. If suspicion of contraction exists, the internal measurements should be also taken.

ERGOT IN LABOR.

Dr. Noble (Trans. Phila. Obstet. Soc., Annals Gyn., April, 1889) narrated a case in which four drachms of fluid extract of ergot were administered by mistake during the first stage of labor. Persistent uterine contraction followed. Rhythmical pains were re-established after a hypodermic of morphia and atropia and the use of chloroform inhalations. The child survived, though asphyxiated at birth. The speaker raised the question of the true place of ergot in obstetrics.

In the discussion, Dr. Longaker said it was his practice to withhold ergot till the third stage was completed.

Dr. Vogler used ergot in inertia, irregular pains, and in hysterical women, without bad results.

Dr. Hoffman did not use it at all.

Dr. Price adhered to it in the Preston Retreat, as Dr. Goodell had done before him, giving a drachm at the close of the third stage. He did not think it needed in all cases.

Dr. Hirst's practice was similar to that of the last speaker's. It was also his custom to administer a full hypodermic of ergot on birth of the head in cases in which post-partum hæmorrhage was feared.

Dr. Baldy thought ergot caused afterpains. Dr. Noble gave it to prevent them.

PUERPERAL ECLAMPSIA.

Parvin (Trans. Phila. Obstet. Soc., Annals Gyn., April, 1889) reports a fatal case of childbed eclampsia with post-mortem findings. The patient was a primipara, seventeen years of age. Urine after the first

convulsion was highly albuminous and contained granular casts. Seven convulsions occurred before the birth of the child, one during the third stage and five after the completion of labor. The patient died thirty-five hours after the first eclamptic attack. The treatment was by chloral, chloroform, and morphia.

The temperature at no time exceeded 102° F., disproving the assertion of Bourneville that in all fatal cases the temperature reaches a high degree. The temperature one hour after death was 98.8° F., contrary to the statement of Hypolitte that the temperature is greatly increased after death from eclampsia.

The autopsy, under the direction of Dr. Wm. Osler, showed the dura dark red in color, large clot in longitudinal sinus, pial vessels deeply congested, gray matter unusually red in color, white matter highly vascular, venous points large and numerous, no special regions of anæmia, basal ganglia normal, no change in ventricles. The condition in all parts of the brain was one of intense congestion. The heart weighed thirteen ounces; walls hypertrophied, cavities normal, muscular tissue in a condition of marked fatty degeneration. Lungs: right, substantially normal; left, pneumonic consolidation at superior two-thirds (catarrhal pneumonia). Pleura over the inflamed area covered with a thin sheet of fibrin. Kidneys presented the appearance of acute nephritis passing into the second stage. The post-mortem findings do not support the theory of McDonald, that the eclamptic attacks are due to the over-action of the vaso-motor centre from the stimulating effect of excrementitious matter retained in the blood. Dr. Osler was unable, on careful examination, to find any evidence of anæmia of the deep cerebral regions and central portions of the cord assumed by Dr. McDonald. An inoculation of a rabbit from the medulla and spinal cord made by Dr. Shakespeare gave a negative result.

Dr. Parvin reviews the various theories of the etiology of eclampsia from the crude hypothesis of Horn in 1765 down to the ptomaines of Battleher and the microbic doctrine of Delore. The etiology is not yet settled. The true solution of the problem is probably to be found in no one cause, but in several. The convulsion in a small proportion of cases may be a purely reflex phenomenon. In others toxic causes may predominate. Contraction of blood-vessels and acute anæmia of the brain are no doubt frequently an important part of the pathology.

Among the therapeutic methods in vogue, the writer alludes to the Vienna treatment by hot baths with cold to the head, chloroform during convulsions, and catharsis by senna and colocynth in preference to salines; Winckel's treatment by warm baths and a cathartic of aloes and colocynth.

Bloodletting is condemned by both Schroeder and Winckel. Tittel lost but seven out of ninety-two eclamptics treated with chloral. G. Veit saved all but two of sixty cases with the morphine treatment, in doses of half a grain increased in from four to seven hours to a total of about three grains. Clark, of Oswego, employed equally large doses of morphia.

PATHOGENESIS OF TUBAL RUPTURE IN EXTRA-UTERINE PREGNANCY.

Kaltenbach (*Zeitschr. f. Geb. u. Gyn.*, xvi. B. 2 H.) The following case is reported, owing to the new light it apparently throws upon the causes of rupture in certain cases of tubal pregnancy. The patient came under the care of D. K. in June, 1888. Age thirty years, mother of five children, sterile for five years. Last menstruation middle of May. First attack of pain and collapse June 29th. When brought to the hospital on the 30th, the patient was profoundly anæmic, speechless and nearly pulseless. On opening the abdomen, which was filled with blood, a six weeks' ovum, enveloped in a clot, was found projecting from a rent in the left fallopian tube, but entirely free from attachments. The broad ligament was ligated, the fruit sac removed, and the peritonæum cleansed in the usual manner. The patient rallied, but again began to sink, and died thirty-six hours after the operation. The abdominal cavity, on reopening the wound after death, was found to have refilled with blood. hæmorrhage had taken place not from the stump, but from a raw surface in Douglas' pouch. The gestation sac had been adherent at this point and had torn away at the moment of rupture, leaving the tube entirely free. The adhesion of the tube in the utero-sacral pouch was believed to have taken place during an attack of pelvic peritonitis following the last labor. That hæmorrhage did not occur from the denuded surface during the operation was explained by the previous blood loss and the anæsthesia. The case teaches that the operator should not trust alone to the extirpation of the ruptured tube for the control of the bleeding. Other bleeding points should be sought for, and all possible sources of hæmorrhage secured, before the abdomen is closed. The case is also instructive with reference to the etiology of tubal rupture in fallopian pregnancy. Simple stretching of the tube wall does not explain all cases. The difference in the time and in the direction of the rupture in different instances are not thus fully accounted for. Neither do spasmodic contractions of the tubal wall explain all ruptures. The bursting of the sac is undoubtedly precipitated in many cases by tearing of the cyst by adhesion bands which are inserted into it. The traction upon the band of false membrane, resulting from the growth of the ovum, changes in the posture of the body, and from varying intra-abdominal pressure plays a part in the mechanics of rupture.

NEW BOOKS AND BOOK NOTICES.

NATURE'S HYGIENE: a Systematic Manual of Natural Hygiene, containing a detailed account of the chemistry and hygiene of eucalyptus, pine and camphor forests, and industries connected therewith. By C. T. Kingzett, F.I.C., F.C.S., Past Vice-President, Society of Public Analysts. etc., etc. Third edition. London: Baillière, Tindall & Cox, 1888. pp. 439.

In the preparation of this, the third edition of Nature's Hygiene, the author has carefully revised the whole work, bringing it into thorough accord with the present state of scientific knowledge on the subject treated, and has added an account of his own investigations concerning the comparative action of a number of antiseptics, the precise chemical history of various fermentative and digestive processes, and the chemistry of camphor oil and Russian turpentine.

The subjects treated in the work cover a wide field. Among the more important are oxidation, fermentation, putrefaction, sewage-contamination, purification of drinking water, infectious and contagious diseases, antiseptics and antiseptic surgery, disinfectants and disinfection, chemical theory of disease, malarial fever and its cause, including an account of the sanitary properties of the eucalyptus and its products, essential oils, terpenes and "Sanitas" products.

The author is a firm believer in the theory that micro-organisms do not produce disease in any direct manner or by their mere mechanical presence in or upon the body, but that the real poisons are of the nature of chemical (toxic) products which result from changes in the media in which the microbes develop and upon which they grow and multiply. This chemical theory of disease which is rapidly gaining ground, the author has persistently advocated for many years.

The portion of the volume which interests us most is that in which the author deals with malarial fever and the destructive influence which the eucalyptus exerts upon its cause. He is confident that in repeated instances the planting of the eucalyptus tree has resulted in the eradication of malaria, or at least has given some protection, even if absolute immunity cannot be claimed for it. This protection he attributes mainly to the essential oil which is given off in a vaporous condition from the trees, and to the products of its atmospheric oxidation in presence of moisture. He thinks it is also partly due to the action of the tree in absorbing water from the soil. In concluding his remarks on this subject he says: "All quarters of the globe have furnished evidence of the sanitary value of the eucalyptus, and no one who is open to conviction can fairly withstand the conclusion that has been arrived at, after the study and experiments of the last half century, which is to the effect that the *genus* is both fever-preventing and fever-destroying.

The value of eucalyptus oil in medicine as a sedative and antiseptic and its preservative properties are thoroughly dealt with. The salutary properties of pine and camphor forests are referred to, and the belief is expressed that the general opinion that such forests exert a beneficial influence on invalids is founded on scientific principles, and that it is to the emanation of the essential oils formed by these trees that this influence must be attributed. To the presence of peroxide of hydrogen additional sanitary properties are due.

The author claims that the natural process which results in producing these essential oils and the emanations which are so salutary, has been reproduced in the manufacture of the so-called "Sanitas products," Sanitas fluid, Sanitas oil, and Sanitas powder, and gives a series of experiments to substantiate their antiseptic properties.

MISCELLANEOUS.

BROOKLYN VITAL STATISTICS FOR AUGUST, 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Population, estimated July 1, 1889, 834,607	The number of Births reported was	1164
In the month of August there were 1505	The number of marriages reported was	308
Deaths the rate of mortality being 21.33 per 1000 of population.	The number of Still-births reported was	104

The mortality by classes and by certain of the more important diseases was as follows:

Causes:

1. Zymotic	405	Malarial Diseases	19
2. Constitutional	355	Diarrhœal Diseases (all ages) ..	216
3. Local	576	" " " (under 5 years) ..	191
4. Developmental	128	Phthisis	179
5. Violence	41	Bronchitis	49
Measles ..	4	Pneumonia	67
Croup	18	All Respiratory	153
Diphtheria	60	Bright's Diseases	41
Scarlet Fever	12	Puerperal Diseases ..	7
Typhoid Fever	22	Old Age	31
Whooping Cough	22	Suicide	7

Reported Cases:

Diphtheria	125	Measles	13
Scarlet Fever	81	Typhoid Fever	90

Deaths by sex, color, and social condition, were as follows.

Male	785	U. S. Native ..	1106
Female	720	Foreign	399
White	1481	Married	350
Colored	24	Single	1002
Widows, Widowers, and not stated ..			153

Still-births, excluded from list of deaths, were as follows:

Males	55	Total	104
Females	49		
Deaths in public institutions	113	Homicides	1
Deaths in tenement houses	799	Suicides	7
Inquest cases			145

Age Periods:

Deaths under 1 year	522	Total deaths, 5 to 20	100
" " 5 years	235	" " 20 to 40	262
Total deaths under 5	757	" " 40 to 60	208
		" " 60 and upwards	178

Certain foreign and American cities show the following death-rate for the month of August:

Brooklyn	21.33	Vienna	23.40
New York	25.99	Paris ..	22.61
Philadelphia	23.18	London	17.80
Berlin	25.75	Glasgow	21.38
Dublin			23.92

BROOKLYN MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

The seventeenth annual meeting of the American Public Health Association will be held at Brooklyn, N. Y., October 22, 23, 24, 25, 1889. Addresses of welcome will be delivered by Hon. Alfred C. Chapin, Mayor, on behalf of the city, and by Alexander Hutchins, M. D., on behalf of the medical profession.

The Executive Committee have selected the following topics for consideration at said meeting :

1. The Causes and Prevention of Infant Mortality.
2. Railway Sanitation.
 - (a) Heating and ventilation of railway passenger coaches.
 - (b) Water-supply, water-closets, etc.
 - (c) Carrying passengers infected with communicable diseases.
3. Steamship Sanitation.
4. Methods of Scientific Cooking.
5. Yellow Fever.
 - (a) The unprotected avenues through which yellow fever is liable to be brought into the United States.
 - (b) The sanitary requirements necessary to render a town or city proof against an epidemic of yellow fever.
 - (c) The course to be taken by local health authorities upon the outbreak of yellow fever.
6. The Prevention and Restriction of Tuberculosis in Man.
7. Methods of Prevention of Diphtheria, with Results of such Methods.
8. How far should Health Authorities be permitted to apply known Preventive Measures for the Control of Diphtheria.
9. Compulsory Vaccination.
10. Sanitation of Asylums, Prisons, Jails, and other Eleemosynary Institutions.

Papers upon miscellaneous sanitary subjects not included in the above list will be received by the Executive Committee subject to the requirements of the by-laws. Preference will be given, however, to papers upon the subjects selected by the Committee in making up the daily programme of the meeting.

All persons who propose to present papers at the next meeting of the Association will be governed by the following by-laws of the Executive Committee :

"4. All papers presented to the Association must be either printed, type-written, or in plain handwriting, and be in the hands of the Secretary at least twenty days prior to the annual meeting, to insure their

critical examination as to their fulfilling the requirements of the Association.

"5. If any paper is too late for critical examination, said paper may be so far passed upon by the Executive Committee as to allow its reading, but such paper shall be subject to publication or non-publication, as the Executive Committee deem expedient.

"6. All papers accepted by the Association, whether read in full, by abstract, by title, or filed, shall be delivered to the Secretary as soon as thus disposed of, as the exclusive property of the Association. Any paper presented to this Association and accepted by it shall be refused publication in the transactions of the Association if it be published in whole or in part by permission or assent of its author in any manner prior to the publication of the volume of transactions, unless written consent is obtained from the Publication Committee.

"7. Day papers shall be limited to twenty minutes, and evening papers to thirty minutes each."

Invitations extended to individuals to prepare papers for the Association do not imply their acceptance by the committee, merit alone determining that question.

It is confidently expected that the Brooklyn meeting will be the largest and most important ever held by the Association. The Local Committee of Arrangements has already organized and have the preliminary local work well under way. No efforts will be spared to make the meeting a grand success, and every arrangement necessary to the comfort of those attending will be made in ample season. All communications relating to local matters should be addressed to J. H. Raymond, M.D., Chairman Local Committee of Arrangements, Brooklyn, N. Y.

Another circular will be issued before the meeting, giving transportation rates, hotel rates, etc.

Blank applications for membership can be obtained by addressing the Secretary, Irving A. Watson.

The officers of the Association are: President, Dr. Hosmer A. Johnson, Chicago, Ill.; First Vice-President, Dr. Jerome Cochran, Montgomery, Ala.; Second Vice-President, Dr. Frederick Montizambert, Quebec, Canada; Secretary, Dr. Irving A. Watson, Concord, N. H.; Treasurer, Dr. J. Berrien Lindsley, Nashville, Tenn.

LOCAL COMMITTEES.

Executive.—Chairman, J. H. Raymond, M.D.; Secretary, R. M. Wyckoff, M.D. Members; C. N. Hoagland, M.D.; A. N. Bell, M.D.; Stephen Smith, M.D.; John Griffin, M.D.; H. C. Du Val, Esq., F. H. Colton, M.D.; R. C. Baker, M.D.; John L. Moffat, M.D.

Finance.—Chairman, C. N. Hoagland, M.D.; Treasurer, E. G. Blackford, Esq.; Secretary, Geo. R. Barns, M.D. Members: P. H. Kretzschmar, M.D.; R. M. Wyckoff, M.D.; Thomas A. Joye, M.D.; Hugh M. Smith, M.D.; John Harrigan, M.D. Duties: To furnish means to meet the expenses of the meeting.

Transportation.—Chairman, H. C. Du Val, Esq., Private Secretary to President N. Y. C. & H. R. R.; Secretary, H. K. Bell, M.D. Duties: To arrange railroad rates for the transportation of members to and from the meeting, and to conduct all correspondence in reference thereto.

Reception.—Chairman, R. M. Wyckoff, M.D.; Secretary, W. A. De Long, M.D. Members: A. L. Gihon, M.D., U. S. N.; W. H. Thayer, M.D.; Alex. Hutchins, M.D.; W. E. Griffiths, M.D.; J. E. Richardson, M.D.; R. N. Denison, M.D.; Avery Segur, M.D.; J. D. Rushmore, M.D.; Wm. M. Ducker, Esq. Duties: To furnish hotel accommodations and obtain reduced rates at same; to receive the out-of-town members on arrival, and direct them to the hotels to which they are assigned; and to conduct all correspondence in reference thereto.

Entertainment.—Chairman of the New York Sub-Committee, Stephen Smith, M.D.; Secretary, E. H. Janes, M.D. Members: A. Jacobi, M.D.; Wm. M. Smith, M.D.; Alexander Hadden, M.D. Duties: to arrange and conduct such entertainment as may be provided in New York.

Chairman of Brooklyn Sub-Committee, F. H. Colton, M.D.; Secretary, Gordon R. Hall, M.D. Members: Andrew Otterson, M.D.; C. E. De La Vergne, M.D.; E. A. Lewis, M.D.; J. E. Richardson, M.D.; P. H. Kretzschmar, M.D. Duties: To arrange for places of meeting of the Association; to provide badges for the local committees and members of the Association; to provide for the social entertainment of the Association and invited guests, at such times and places as may be appointed; to obtain from clubs, libraries, and other similar organizations the freedom of their privileges for members of the Association during their stay in the city; to obtain, so far as possible, from ferry companies and local railroad companies free transportation for the members of the Association, on the exhibit of their badges of membership; and to see that the out-of-town members are informed of location of meeting-places and places of entertainment, and in general made to feel at home.

Literary.—Chairman, John Griffin, M.D., Health Officer; Secretary, G. V. Convery, M.D. Members: D. G. Bodkin, M.D.; J. F. Moore, M.D.; E. Palmer, M.D.; A. Rae, M.D.; T. A. Joye, M.D. Duties: To provide for the presentation to the Association of local papers on sanitary subjects; to enlist the hearty co-operation and sympathy of the press of Brooklyn and New York, and to secure from it a reportorial staff and ample space to publish daily a full account of the proceedings of the Association; to provide a stenographer for the official report of the proceedings and discussions; to print the daily programme of the meetings of the Association, and such other matter as may be necessary.

Municipal Relations.—Chairman, R. C. Baker, M.D.; Secretary, W. J. Corcoran, M.D. Members: Chas. Zellhoefer, M.D.; J. E. Smith, M.D.; R. T. Blohm, Esq.; R. E. Van Giesen, M.D.; T. A. Beard, Esq.; M. Wafer, Esq.; E. G. Metcalfe, M.D.; M. J. Coffey, Esq.; S. M. Weeks, Esq. Duties: To enlist the hearty sympathy and co-operation of all the municipal authorities, and to obtain from them such concessions and privileges as may be desired.

Exhibits.—Chairman, A. N. Bell, M.D.; Secretary, E. H. Bartley, M.D. Members: Stephen Smith, M.D.; W. K. Newton, M.D.; W. E. Worthen, C.E.; W. C. Otterson, M.D.; A. L. Gihon, M.D., U. S. N.; E. H. Janes, M.D.; Jerome Walker, M.D.; Col. J. W. Adams; Robert Van Buren, C.E.; F. D. Bailey, M.D. Duties: To arrange for an exhibit of foods, sanitary appliances, etc., at some convenient location, open to the public during the meeting of the Association and as much longer as the committee may determine.

New Members.—Chairman, John L. Moffat, M.D.; Secretary, Clark Burnham, M.D. Members: J. A. McCorkle, M.D.; H. M. Lewis, M.D.; Jerome Walker, M.D.; B. F. Westbrook, M.D.; E. Hasbrouck, M.D.; R. L. Dickinson, M.D. Duties: To obtain for the Association as large a number of new members as is possible.

THE
BROOKLYN MEDICAL JOURNAL

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III. No. 11. }
WHOLE No. 23. }

BROOKLYN, N. Y., NOVEMBER, 1889.

{Single Copies 25 cents.
{\$2 a year, in advance.

ORIGINAL ARTICLES.

THE QUESTION AS TO THE RADICAL CURE OF HERNIA
IN ITS PRESENT ASPECT.

BY GEO. R. FOWLER, M.D.,

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Without attempting to enter upon an historical survey of the entire subject of the radical cure of hernia, it may be stated in general terms that attempts to bring about a closure of the apertures through which herniated portions of the intestinal canal have escaped from the abdominal cavity have occupied the minds of practical surgeons for many years. Efforts in this direction, however, have mainly been directed to, 1st, the wearing of apparatuses or bandages (trusses) making pressure upon the inguinal canal and abdominal rings with the view of creating some adhesive inflammation in the neighborhood of the latter upon their extra-peritoneal aspect, and the use of irritating hypodermatic and hypofascial injections designed to bring about a similar result by setting up a greater amount of inflammation than any amount of pressure which can be borne by the patient could possibly produce.

The subject of the possibility of producing a radical cure by the use of trusses or other means of producing pressure may be dismissed in a few words. I think all surgeons are agreed alike upon the usefulness of these means as palliative, and affording protection to the patient against

one of the dangerous sequences of the occurrence of a hernia, *i. e.*, strangulation, as well as their entire and absolute uselessness as curative measures in the sense intended to be conveyed by the term radical cure. In an experience extending upwards of twenty years, at least half of which was gained among the class of persons most prone to this affection, I can safely state that I have yet to see the first case that has been benefited other than in a protective manner by the wearing of a truss. And I may go further than this and assert that the constant pressure of a truss designed by some ambitious maker to effect a cure and which consequently exerts an amount of pressure far in excess of what is needed for purposes of protection simply, does harm by producing an attenuation or atrophy of the parts against which the pressure is brought to bear, and consequently lessens the resistance to the descent which would otherwise be afforded. This is demonstrated by the fact that those who wear a truss for a long time gradually find themselves compelled to increase the size and alter the shape of the pad as time passes.

I have no intention of introducing a dissertation upon the use of trusses, but rather to raise my voice against the abuse of these instruments by attempting with their aid the useless and hopeless task of producing a radical cure of hernia.

As to methods of producing an irritation in the subcutaneous and subfascial spaces sufficient to produce an adhesive inflammation about the pillars and columns of the rings and canal, (Luton, Schwalbe, Heaton, Warren), and into the sac itself (Keetley), the patient in the meanwhile being kept in the dorsal decubitus for a greater or lesser length of time, I am free to confess that I have never thought sufficiently well of the rationale of these methods as expounded by their originators and advocates to even give them a trial. I am opposed upon general principles to any procedure which does not bring, as far as possible, within the control and grasp of the surgeon all the factors entering into the operation and the result which it is designed to bring about. That this cannot be said of the method of radical cure by injection is obvious at a glance, for no amount of foresight can provide, on the one hand, against the production of an inflammatory condition sufficient to produce consequences to be deplored; nor on the other hand, assure the operator that a sufficient amount of irritation and consequent inflammation has been set up to achieve the object in view, *viz.*, the agglutination of the surrounding structures into a mass with sufficient resistance residing within itself to offer a permanent barrier against the re-descent of the gut, when the patient assumes the upright position.

Attempts to produce a sufficient amount of irritation and inflam-

mation in and about the surfaces of the peritonæum constituting the sac itself and that portion of the parietal reflection at the site of the internal ring have been made. The box-wood plug and curved needle of Weber is a fair example of this method. Want of exactness in the procedure itself and uncertainty as to the final result have both contributed to impair the confidence of surgeons in this means of radical cure.

Attempts to approximate the margins of the internal ring, and the regions around the hernial sac (extra-peritoneal invagination of the sac, Wood, Agnew, Chisholm, Lawton), without external incision, have been followed by a far greater measure of success than the foregoing. This method has its strongest advocate, if not indeed its pioneer, in Prof. John Wood, of London, and his method, in his own hands, has been followed by some excellent results. The complicated nature of this procedure will be apparent to any one who attempts to follow intelligently and without previous practice on the cadaver the manipulation of Wood, as laid down in the text-books. Recent herniæ, and those occurring in children who have not been subjected to treatment by means of truss pressure, have been found, in my experience, to be the cases best adapted to this method of treatment.

In order to more accurately approximate the margins of the ring, and at the same time guard against the possibility of wounding any abdominal viscera, Lawson Tait, the famous Birmingham surgeon, has proposed to make a median abdominal incision sufficient to admit one or more fingers of the left hand. The latter are passed to the inguinal ring, identifying the latter, guarding against the reprotusion of the gut after its reduction, and serving as a guide in the passage of deep silk or silver wire sutures, so placed as to completely fold together the parts lying to either side of the ring. This suggestion, coming from such a successful laparotomist as Tait, is worthy of attention and trial.

The confidence in the success of operative methods generally, engendered by the advent and triumphs of the antiseptic methods of wound management, led surgeons to devise measures of cure in hernia not heretofore considered applicable, nor even justified. Incisions made directly down upon the sac, the separation of the same from the inguinal canal, emptying it of its contents, ligature of the neck at the internal ring and cutting away of the rest of the sac (Czerny, of Heidelberg); suturing the sac in situ with silver wire, allowing this to remain permanently as an additional security against recurrence (Banks), and approximating the margins of the ring and canal (Banks, Leontè); twisting the isolated sac until its rupture seems imminent, securing the latter by ligature, and suturing it through and through to

the skin to prevent untwisting, (Ball), or redoubling upon itself the sac and suturing it to the parietal peritonæum after detaching the latter at the internal ring for the space of half an inch or more, covering in the doubled-back portion by drawing over it the margins of the ring, (MacEwen);—these, followed by suture of the incision, constitute a class of operations which has found favor during the last decade among practical surgeons. When to these is added the method known as McBurney's, which consist essentially in hemming the edges of the incision to prevent their immediate union, after emptying the sac, ligating its neck, and removing the balance of the same, it may be predicted that these will occupy the field to the exclusion of all other methods, in the vast majority of cases, for the radical cure of hernia. The last named particularly recommends itself, for the reason that the peculiar method of managing the edges of the incision results in the formation of a firm plug of cicatricial tissue, which completely obliterates the inguinal canal itself and forms a firm and unyielding bar to a redescend of the gut. Whatever operation is chosen it must fulfil the following conditions: 1st, The hernial sac, as well as everything else which can possibly predispose to a recurrence of the disease, must be effectually disposed of. 2d, The point of escape of the hernial protrusion must be completely filled up. 3d, The intra-abdominal pressure is to be diminished as much as possible. 4th, The weakness of that portion of the abdominal wall must be corrected.

It is obvious that the question as to the justifiability, as well as the desirability of undertaking the radical cure by operative methods of a condition which does not threaten life save through the medium of some accidental complication, and which therefore must necessarily come under the head of an operation of convenience, will naturally turn upon the answers which may be given to the two following queries: 1st. What are the indications which are to guide the surgeon, as derived from the mortality of the operative procedures last suggested, (open incision and direct dealing with the sac, ring and canal). 2d. The prognosis as regards ultimate cure.

In answer to the first question it may be stated, as a general proposition, that the larger the experience the more convincing the proof becomes as to the desirability of ridding patients affected with hernia of a condition which is always one of discomfort, and which at any moment may place his life in the greatest jeopardy. For instance, Trélat¹ collected and commented upon 307 cases, constituting the experience of several operators, and among these not a single death is

¹ Congrès Français de Chirurgie, March 12-17, 1888, Paris.

recorded. Extending the observation to all cases recorded, these including the work of surgeons who are not at all particular in the selection of their cases, and the very highest mortality thus far counted against these operations amounts to one in four hundred, or one-fourth of one per cent. It is not to be wondered at that Lucas Championiere, in view of this favorable showing and from the fact that the fatal cases have always included only old persons with some marked cachexia and large hernias, declared that the operation is always justifiable, even as one of convenience. And this need not necessarily be regarded as an outburst of enthusiasm on the part of the French surgeon, when it is borne in mind that operative methods having in view only the correction of deformities which do not and never can threaten life, such, for instance, as those for talipes, and which therefore become essentially operations for convenience, and in which no better results can be shown as far as either immunity from danger in the operation itself is concerned, or ultimate benefit derived, are generally conceded to be justifiable.

But if we consider the views of operators of experience who are the most conservative in their views regarding the indications for operating, we will find that all are agreed that interference is always to be recommended when the hernia cannot be retained easily, painlessly, and with certainty. Stress is laid by most surgeons upon the necessity of operating in all cases in which the hernia has a tendency to increase rapidly in size.

As to the desirability of attempting the radical cure of hernia in case in which strangulation has already occurred, there certainly can not be two opinions. Once herniotomy has been determined upon, and the suggestion to prevent a recurrence of the accident by shutting off the escape of the gut from its normal environment occurs, as a matter of course. The slight additional time occupied and traumatism inflicted can have no weight in the mind of the surgeon who has his patient's ultimate good as well as immediate necessity at heart, when placed in the balance with the incalculable benefit to be derived from a careful planning and rapid execution of one of the many operative procedures designed for this purpose. Of course this statement presupposes that in all cases of strangulated hernia operated upon in these times of improved technique and aseptic methods, the sac is to be opened and the condition of the intestine carefully noted before attempts at reduction are made. I imagine that it would be somewhat of a rarity nowadays, to find a surgeon at all familiar with recent methods who would pursue the practice of groping around the internal ring with an Astley Cooper's herniometer, seeking for a constriction outside the neck of the sac, and having released the latter by dividing

the former, return both sac and contents into the peritoneal cavity and trust to a lucky Providence that no vessel has been wounded, or the intestine is not sphacelated nor constricted by adventitious bands within the sac itself or its neck. I assume, when I assert that an operation for radical cure can add nothing worthy of discussion to the dangers of the operation of herniotomy, that the whole procedure shall be of a character that shall permit of the addition of this addendum to the first and necessary operation. Without presuming to trespass upon the domain of the gentleman whose duty it is, in this symposium, to treat particularly of the operative technique of strangulated hernia, I would simply state that the three essential points to which I would call attention in what I deem a properly conducted operation for strangulated hernia, refer, 1st, to asepsis; 2d, the division of all points of constriction from without, always and invariably opening the sac for that purpose, and if necessary by extending the primary incision well above the internal ring ("Laparotomie laterale," Kirmesson²); and, 3d, the opening of the sac and examination of its contents in every instance. With these points properly considered, the prognosis of operations for radical cure in strangulated cases simply becomes the prognosis of the herniotomy itself, as shown by Socin, of Basle, in a report of 160 cases, 85 of which were strangulated.

Of almost equal importance with the mortality of the operation itself is the second question, namely, the prognosis as regards ultimate cure. While the question of the mortality occupied our attention, quite definite statements could be made without taking into account the particular method of operating, inasmuch as it is found that about the same amount of danger, be it greater or lesser, attends all procedures involving open incision, and the direct treatment of the sac, together with its contents and the margins of the ring and canal. But here there are other questions entering into the study. These include: 1st, the age of the patient; 2d, the length of time of the existence of the hernia; 3d, the fact of a tightly fitting truss having been worn or otherwise; 4th, the presence or absence of large openings with loose coverings and masses of omental fat; 5th, the particular operative procedure selected; 6th, the after treatment of the case, and the after behavior of the patient.

Socin, who has had probably a larger experience than any living surgeon in the treatment of hernia by operative methods of radical cure, states that in his hands sixty-two per cent. of final permanent cures occurred in individuals under twenty-five years of age; while in older persons a percentage of only forty-two was

² Gaz. des Hopitaux, 1888, No. 49.

reached. This difference is due to the varying anatomical conditions, which latter in their turn may be modified or altered by such extraneous circumstances as the physical condition of the patient and the previous habit of keeping up a continuous pressure at the site of the protrusion. This latter will almost certainly initiate and perpetuate a process of gradually progressive attenuation or atrophy of the hernial coverings, together with a tendency to the formation of a large opening until the whole of that portion of the transversalis fascia which constitutes the floor of the inguinal canal is thrust forward, and the internal and external rings become blended together as one. This, occurring in an individual of an obese habit and in whom considerable omental fat escapes into the sac when the pressure of the pad is removed, constitutes a condition of things rather unfavorable to a radical cure. In young individuals with congenital hernia the largest percentage of successes is obtained, other things being equal, the nearer the anatomical condition approximates to those found in the latter, taken as a standard at any period of life, the greater the chances of success. In other words, if, from age, pressure from wearing a truss, or the long persistence of an unreduced hernial mass, the extra peritoneal tissues adjacent to the canal and ring, as well as the coverings of the hernia proper, have lost through atrophy their normal elasticity and resiliency, then at any time of life and with any kind of operation the ultimate prognosis is unfavorable. Taking all possible anatomical conditions into account, I may say, in general terms, that an average of fifty per cent. of ultimate cures may be obtained, provided care be taken in selecting an operative procedure that it is suited to the case under treatment. Further, it may be said that while almost any of the now recognized operations will fulfil the most sanguine expectations as regards both immediate and remote results in cases considered as favorable, so far as the youth of the patients and anatomical conditions present are concerned, as judged by the rules laid down above; on the other hand, unless care be exercised in the selection of the special operation for a case, which, judged by the above standard, cannot be looked upon as a favorable one for operative treatment, the failures in this class will outnumber the successes.

From what has already been said, it may be inferred that in the opinion of the writer, in passing judgment upon the probable final outcome in a case of hernia in which it has been decided to attempt the radical cure, the particular operative procedure to be adopted is to be taken into account. While, in favorable cases, a simple reduction of the hernia and the establishing by means of adventitious tissue, of adhesions between the peritoneal surfaces in the neighborhood of the ring; with perhaps a narrowing, though not necessarily a closure of

the latter (as in Wood's subcutaneous wire or silkworm gut loop, as well as some of those involving an external incision), conjoined with the natural and retentive resiliency of the abdominal wall, a recurrence of the hernia need not be expected; on the other hand, these measures, in my experience, are entirely inefficient in cases where the anatomical conditions do not favor the cure. Indeed, it may be stated in this connection, that in extreme cases no operative procedure will suffice. I have seen a recurrence after my best efforts have been directed to accomplish a radical cure. The re-descent does not always occur into the canal itself, but the hernia rather takes the form of a true ventral, an intraparietal or a properitoneal protrusion, especially in those cases in which the inguinal canal has been obliterated.

It is probable that the prognosis as regards ultimate result will be very much improved by the introduction of the operation of McBurney. The treatment of the edges of the incision by hemming them, or the application of a button-hole stitch, as more recently practiced by myself, leaves an elliptical shaped gap at the site of the inguinal canal, the inner margin of which corresponds to the transversalis muscle and the conjoined tendon, the external margin to Poupart's ligament, and the floor of which consists of the transversalis fascia. By carefully keeping these edges asunder by firm packing and compelling the patient to maintain the dorsal decubitus during the process of healing, this gap fills up in about six weeks with a firm cicatricial plug, than which nothing could be more desirable for the purpose of offering a firm barrier to a re-descent of the hernia. With an experience with this operation in cases of all ages, from the infant of two and a half years to the old man of eighty, I am prepared to assert that it will be found applicable at the different periods of life, and to all of the anatomical conditions met with, and to prophesy that it will take its place as the operation of the future for all herniæ occurring in the inguinal region; as before stated, a much larger percentage of final cures will be recorded when its general application is recognized by surgeons. Failures, as a result of this, will be fewer among the old and apparently hopeless cases.

The prognosis of the radical cure, as to ultimate result, will also vary, as the after-treatment and after-behavior of the patient varies. The question as to the benefit or harm arising from wearing a truss is a serious one, as well as the occupation which the patient pursues during the first few months following the operation. Patients are too apt to reason that, if they have had a radical operation performed, they are at liberty to pursue their former occupation. If this latter consists of laborious work, involving the lifting of heavy weights, or making vigorous straining or muscular efforts, it should certainly be inter-

dicted for the first three months at least; else the patient will quickly present himself with a ventral or properitoneal protusion, and a failure recorded where otherwise a success might have been scored.

That a recurrence of the hernia may be favored by the wearing of a truss in the after-treatment, personally I cannot for a moment doubt. Opinions upon this point differ greatly, however. Socin declares it to be superfluous at least and possibly even harmful. Lucas Championnière, who, next to Socin, has the largest experience in the radical cure of hernia, agrees with the latter in this particular. Segoud, in mild cases, asserts that no truss need be worn, while in severe cases in which large hernias had existed and which had been retained with great difficulty, he orders a truss to be worn after the operation. Many other operators also pursue the latter course.

Certainly no procedure which falls short of permitting the patient to pass the rest of his life unincumbered by a truss is worthy the title of an operation for radical cure.

In the method introduced by McBurney, its author strongly insists that the patient shall wear no truss after the operation. The point is made by him that the pressure exercised by the application of a truss of any sort leads to a gradual thinning and weakening of the cicatrix and surrounding structures, and the instrument which at first is worn as a precautionary measure finally becomes a necessity.

If the writer may be allowed to express his own views, based upon his personal experience and a knowledge of the work of other surgeons, upon the general subject of the radical cure of inguinal hernia, he would formulate them about as follows:

1. As to the selection of cases in which the radical cure is to be recommended, it may be said that the operation becomes one of necessity in all young persons with hernia, in the lower walks of life where existence depends upon some form of manual labor. Among these there always exists a demand for a snug or tightly fitting retentive apparatus; this alone will in the course of time so alter the anatomical conditions as to render it next to impossible to retain the hernia in position as well as increasing the difficulties of a radical cure. Again, the expense and want of time to devote to personal needs prohibits most of this class from keeping themselves supplied with the most approved form of truss, and likewise from keeping the same in repair. Hence, there is always a temptation to either do without entirely, in ignorance of the dangers of such a course, or to place reliance upon an instrument which may either be inefficient or inapplicable for other reasons. On the other hand, among the better class where ample means exists, and probably always will, to provide the best possible appliances and keep the same in an efficient condition; where the

mental calibre of the patient is such as to grasp the situation and appreciate the dangers attending a careless disregard of instructions regarding the use of the truss, the operation may be regarded as one of convenience, and operative measures are to be instituted exactly as in the condition, analogous in this respect, of club foot. The judgment in this class of cases must be largely influenced by the wishes of the patient, or his friends, if he be too young to express his own desires, the probable prognosis as regards immediate and remote success being fully explained, as well as the conditions which may be confidently looked for, and the undeniable fact being stated, in case a cure is not sought, that a person with a hernia is always handicapped in the race of life, is the subject of a constant discomfort, and may fall a victim at any time to an accidental strangulation of the gut. I should insist, further, that if in either of these classes at any time it should transpire that the hernia cannot be retained without undue distress, or with ease and certainty, the radical cure, in view of the exceedingly favorable results obtained, is called for.

2. In all cases of strangulated hernia the operator owes it to himself, as well as to the patient, not to allow the latter to leave the operating table until the operation for radical cure has supplemented the necessary herniotomy.

3. The age of the patient need not be taken into account, providing the operative procedure selected be of a character suited to the requirements of the case. An operation like that of McBurney, suited as it is to the worst cases, is equally easy of performance in simple ones, and is best suited to all anatomical conditions, with the bare exception of a recently developed direct inguinal hernia. Even here, although not absolutely necessary, inasmuch as the passage of the hernial protrusion does not recur through the external ring or from the outer side of the conjoined tendon after operative methods directed to an approximation of the margins of the same, yet, the formation of a cicatricial plug filling the inguinal canal will guard the patient from ever becoming the victim of the form of hernia much more commonly met with, namely, the oblique, or that which escapes from the internal abdominal ring. For these reasons this operation should be the one chosen.

4. With regard to the after-treatment, not less than six weeks in the recumbent position is to be considered essential, and no truss should be worn after the operation.

5. With these requisite conditions fulfilled it is fair to state to the patient, if he be a young person (under twenty-five years), that a cure may be assured; if he be an older person, still the chances are largely

in his favor, and including the worst cases the proportion of cures averages at least fifty per cent. The mortality, if individuals with chronic organic diseases or well marked cachexia be eliminated, may be said to be next to nothing in proper hands.

PROFESSIONAL FADS.

BY WILL H. JOHNSTON.

Read before the Brooklyn Dental Society, May 27th.

The subject chosen for my paper this evening is one which I deem especially important to the younger members of any profession and proportionately important to all. I would therefore that it might have been presented to you to-night by one more competent to express in forceful language the convictions born of experience.

A "fad" is tersely defined in the later editions of the dictionaries to be "a hobby," and only in the later editions I think will it be found. It has become, however, so commonly used to express this idea that I presume any explanation is unnecessary.

It is the common thing nowadays to find that our neighbor across the way, the friend whom we meet at the club, at the lodge or in the church, is engaged in some pursuit that may happen to be the fashionable "fad" of the hour. Many of these are amusing but harmless; some appear to us ridiculous, idiotic even; a few are undoubtedly pernicious. While the fashionable "fad," however, inflicts injury only upon the one who gives himself up to be influenced thereby, the professional man who allows reason to abdicate in favor of some theoretical vagary, and goes about his business with a constant prayer that Providence may send him some one by whom he can prove to the world the honor he confers upon it by living, is likely to answer his own prayers by making a victim of the first innocent that chance drifts within his reach. This tendency it is which greatly diminishes his professional usefulness and makes him in a greater or less degree a menace to the increasing aggregate of human happiness.

A well-known physician of our city, in a brilliant paper read a short time ago before the Odontological Society in the city of New York, spoke of the marvelous progress of modern surgery as evidenced by its achievements in the operation known as laparotomy; but I will venture the assertion that he never considered as among the possibilities the spectacle of a member of his profession performing this dangerous operation two or three times a week, oftentimes apparently for purposes of diagnosis.

I am informed by reputable prescription clerks that there *have* lived in this city physicians of extensive practice who kept in mind three or four stock prescriptions and who seldom allowed themselves to step outside the well-beaten paths. I have heard it hinted by men with equal facilities for gaining information that there are *now* living in our city some who were famous for their "shotgun prescriptions," dosing every important case with all the new and untried drugs in the market.

But while it may be amusing to consider the failings or to laugh at the foibles of others, let us spend a little time in a more profitable way and call attention to some of the "fads" that in the past in our own specialty have barred the path of real progress, and inquire a little into some of the "shibboleths" of the mighty present.

Very many years ago I call to mind a gentleman (perhaps some of you may remember him as well) whose "fad" at that time was the theory that gold was the only substance fit for use as a filling material. He was a man very positive in his convictions (at least he was very positive in his statements); he had a wonderful command of language, and could talk longer and louder than any man in the assembly. Gold, he insisted, was the only material that any respectable practitioner ought to think of using when called upon to repair the ravages caused by dental caries. Were not some teeth when first presented for his care so frail that there would be danger of fracturing the enamel in using gold? Not at all. He could condense with an eight ounce mallet any quantity of gold without endangering the frailest wall. Were not some cavities so inaccessible that under the circumstances a dentist would be justified in using perhaps an amalgam or a —? *Never*. Out upon the man who would so lower the standard of his profession as to consider for a moment the substitution of such a base alloy. But, at least, when called upon to give comfort to the little children he did not insist upon subjecting them to the ordeal of having gold hammered into their little molars? Yes, always. He gave them to understand that he kept nothing *but* gold in his shop and they must submit to his superior judgment. But really he never had any trouble on this score. Under the magnetism of his gentle manipulation the little children, no matter how timid or how nervous, became his most grateful subjects.

Is the picture overdrawn? Those of you who were in the habit of attending the "conventions" of twenty years ago must have met this gentleman there. Sometimes he represented the East and sometimes the far West, and again he hailed from the South; but I think you will bear me out in the assertion that the gentleman with this particular "fad" generally dominated the assembly and met with little serious opposition.

I remember a little incident that happened about the time when this "fever" was at its height, which made a peculiar impression upon me and which will serve to show the state of the professional mind during this period, of the leading men in our specialty. It was near the close of an evening's discussion upon the use of gold in broken down teeth and in difficult cavities, when one of the younger members proposed his conundrum to one of the older and most respected members of the profession something as follows: I would like to ask Dr. X. "if a patient presented herself to him with a cavity upon the posterior surface of a superior wisdom tooth, the pulp not exposed and yet very sensitive, what would you advise?" Dr. X. considered for a moment, and then slowly replied: "If I had such a tooth as that in my mouth, I should go to the best dentist I knew and ask him to prepare the cavity as carefully as he could and then fill it with amalgam." The good doctor did not want to go on record as recommending the use of an alloy, and yet he was too honest to say that in such a supposed case he would advise the use of gold. But all this was a great many years ago. I see that the Odontological Society spent an evening not long since in glorifying amalgam, and copper amalgam at that.

It is not in the nature of "fads" to enjoy long continued popularity, and this one, with its numerous and eloquent advocates, proved no exception to the rule.

One of the most brilliant members of our profession, a gentleman with a sanguine temperament and a sandy complexion, arose in open rebellion at last and proclaimed a new "fad." Instead of gold being the only material fit for the preservation of the tooth structure, he boldly asserted that "in proportion as teeth needed saving gold was the very *worst* material that a dentist could use for that purpose." This proposition he proceeded to demonstrate with a logic so unanswerable and an eloquence so captivating that the gold men held their breath, as one does when at the close of a luxurious Turkish bath the attendant turns a faucet and you find yourself under a deluge of cold water. His most telling argument, however, was a pathetic recital of woes entailed upon the human race by those ridiculous men who had insisted upon hammering beautiful gold fillings into every tooth that came within reach of their mallet. But for the painfully evident truth of the deplorable picture he drew, his particular "fad" would never have attained the prominence of a national issue.

Many accepted his theories and practised them to their future sorrow and humiliation, yet in the terse statement given of his position, that "in proportion as teeth need saving gold is the worst material with which to fill them," there lies the grain of truth which has

destroyed, we hope forever, the pernicious activity of the golden "fad." To-day the men in our profession of the widest usefulness frankly acknowledge their employment of amalgams, the oxy-phosphates, and gutta percha, as well as gold, as agents through which they express their best service to their patients. So through the contending forces of these opposing "fads" a proper equilibrium is being established which will add much to the aggregate of our usefulness in the future.

Then I remember meeting somewhere, at sometime, a worthy member of our profession who astonished us youngsters, when asked as to the best method of destroying a badly exposed pulp, by declaring that he never destroyed any. Arsenious acid was probably the best thing to use, but he never allowed anything of the kind to be brought into his office. He believed that the pulp of any tooth might be saved, and he should consider it a case of malpractice to put arsenic on one because he found it exposed. If it was in a healthy condition there was of course nothing to do but to cap it carefully; if it was sick, treat it until it was restored to health; if it was nearly dead, amputate what had really passed away, restore the rest to vigor and activity, measure carefully the exact distance up the root to the living tissue, and fill up just to there, being very particular not to bring any pressure, etc., etc.

This is what the more irreverent among the boys might term "rot." But there have lived men among us who seriously advocated such a course of procedure, and strange to say you heard his echo at nearly every large gathering of dentists.

Then there was the man who deprecated the use of poisonous drugs, and declared that the best way to destroy the pulp was to shape an orange wood spile as near as possible to the pulp chamber, and with one blow of the mallet to drive it up into the root. He declared that it was surprising how insignificant was the pain caused by his method. This gentleman did not fill many teeth, it was so much more convenient to saw the tooth off, drive in a spile, and fit on a crown. We do not hear much said just now about this short cut to glory, but it may be silently winning its way.

Many similar cases of erratic methods and emphatic claims for superiority, though perhaps less widely promulgated, will be called to mind by those conversant with the progress of societies during the last twenty-five years, but I will not take the time to refer to them here.

Let us turn our attention for a little time to a few of the "fads" which seem to dominate the present and which may be the means of leading some of our more optimistic co-laborers out into water that is over their heads. And let me say right here that I believe that any theory to secure wide acceptance must contain the germ of truth which com-

mends it to reason, and it is only when reason seems to be giving way before the enthusiastic pursuit of something new, that it becomes necessary for some one to sound a note of alarm.

In the first place, let us consider "teeth without plates." The past twenty-five years has witnessed the evolution of the "tooth crown" in all its strength and beauty from the old fashioned "pivot tooth." As we all know, it is not a new invention, and to no one man belongs the glory of its perfection. This I say without wishing to detract from the honor due to any or all those who have labored more or less successfully in this direction. As it stands to-day, it is in my judgment one of the most potent adjuncts of modern dentistry and places within our reach a means of service to mankind that has in the near future the highest possibilities. But now notice, how soon from a good thing a man degenerates into a hobby rider. He crowns a canine root and a second bicuspid, and the first bicuspid having been extracted it occurs to him to attach a third tooth to the crown on either side. The work is well done, and is pronounced a success by the patient. The worthy brother tells of his exploit at the next meeting of his society. A vast field of experiment is opened, and the spirit of rivalry is soon at fever heat. The bridge expands, the span stretches from cuspid to cuspid, from cuspid to molar, until at last some proud enthusiast exhibits to the admiring gaze of some convention a beautiful specimen of workmanship consisting of fourteen teeth which he proposes to cement to two old broken down molar roots. Now from the time the first span was stretched from canine to second bicuspid, anyone could see that this was a possible thing to do, but is it a good thing to do? I believe that the day will soon come, if it has not already dawned, when these extended bridge builders will look back with mortification upon their particular "fad," and if they are honest repent in sackcloth and ashes.

There is something very fascinating about this "bridgework," especially as its successful completion, like all other works of civil engineering, betokens a more than ordinary amount of skill; but will it stand the test of time, and comfortable service. It may be well for some one to make experiments, but when hundreds, with all ideas of reasonable service made secondary to their pride in skilful manipulation rush headlong after some brilliant "fad," the resultant sum total to the community at large is something awful to consider. The truth is that "bridgework," even in its more moderate development, has elements of weakness, which in my mind make its adoption in many if not in most cases a matter of very doubtful expediency. The chief among these are its uncleanness and the difficulty attending its repair. The former has been charged against it from the start, and I

have examined many beautiful specimens at various times and places, wherein the chief advantage claimed was the precaution taken, by means of which this grave offence would be made impossible, and so that with less than ordinary care they might be kept as clean as the natural teeth. As I looked at them and listened to the proud father growing eloquent over the many virtues of his child, I could not see why all should not be as he fondly wished. I must say, however, that I have never seen a piece of "bridgework" after being worn for three months, which was as clean as the natural teeth in the same mouth. Some of this work was my own, and more was not.

The second difficulty is one which may react more seriously to the dentist than the first and is the one which may the more certainly bring this work into disrepute, for strange as it may seem, the great majority of people are not as sensitive in the matter of cleanliness as we might imagine, especially if the offence cannot be seen. It is comparatively easy to make the bridge strong, if the span be not too long, but as long as we are compelled to use porcelain teeth we must be prepared to repair a fracture. Not long ago I received a call from a young lady who was in great distress. She said that her home was in one of the great cities of the West, and that she was in Brooklyn visiting some friends. "I had planned," she said, "to remain here three or four days longer, but I shall have to return home at once to have a tooth repaired." I told her, with some pride, that it was quite likely she could find some one in the city of Brooklyn who would be able to make what little repairs were necessary, and thus save her the necessity of returning home sooner than she had planned. I intimated that I thought myself equal to the undertaking if she felt confidence enough in me to let me try. Upon examining her mouth I found a beautiful bridge of six teeth cemented firmly upon two cuspid roots, and the lower half of the left central incisor gone. She informed me that while drinking from a goblet the evening before, some one had playfully hit her elbow, and the edge of the glass had struck the tooth with such force as to produce the condition which I have described.

What was I to do? My pride was all gone and I was perhaps the most humble man she ever saw, unless it was the gentleman who made the beautiful structure, when she presented herself in his office and asked him what he proposed to do about it.

After examining carefully the setting, I had to tell her that I thought I could duplicate the whole thing for her, and I could not promise that any less an operation would be sufficient if I attempted to remove the crowns. I am sorry I did not get the name of her dentist so that I could write to him and get his opinion regarding the difficulties attending this class of work.

After the "all gold fad" had received its death blow by the valiant champion of the "plastics," the members of our profession began to turn their attention to the improvement of the latter, and especially the color of the amalgams. That great improvement has been made in this direction is unquestioned, but during the last few years we have been waking up to the fact that all the progress made thus far along this line has been made at the expense of the object first to be desired in most cases, namely, the preservation of tooth structure. The tendency of men to run to extremes is again manifest. What were the old amalgams that seemed to produce these better results, and in what did the difference consist? This was a matter easily to be determined, for in the old days the various brands in the market were not as numerous as they are now, and it was soon understood, after attention had been turned in that direction, that those most useful were the alloys containing a small percentage of copper. Now if a little copper could be used in the amalgam with good results, why not use all copper. The reaction in this direction during the past year is something that would astonish any chemist outside of our profession, and strange to say the advocates of the use of copper amalgam are found to-day chiefly among the better class of operators. It is hard to account always for the unexpected influences that tend to make any article or practice popular, but as the wide sale of "gold and platina alloys," so-called, was hastened by the opportunity it gave the dishonest to impose a higher fee upon the public under protection of a false reason, so the use of copper amalgam seems to appeal to some because it antagonizes that very thing which is so distasteful to them. Societies are spending whole evenings in discussing the subject and in praising its good qualities, while few interject a word of caution. I am not able myself to condemn a practice from observation which is so new in our city, but I know that in all other forms *except* as amalgam, copper is a dangerous metal to come in contact with the mucous surfaces, because it is so easily acted upon by the various acids. I should especially be fearful of using a copper amalgam in a mouth where the surface kept bright, for I think only the constant action of some acid could produce such a condition of the filling. I would not denounce the use of copper under all circumstances, but don't ride your hobby too hard, it is possible that after you have some pounds of copper distributed around among your patients that you will regret it.

Just now another "fad" is known as "immediate root filling." Almost as long ago as I can remember, I call to mind some of the cooler and more thoughtful members of our profession uttering words of caution in regard to over-treatment of pulpless or abscessed teeth, but I am sure that they would to-day find a text for their sermon in

their too careless preparation oftentimes, and while no doubt admitting that there were teeth whose roots might safely be cleaned and filled at one sitting, would very earnestly protest against such a practice being urged in all cases. That time will serve to alleviate the more violent manifestation of this fever I have not the least doubt, though it be at the expense of a long suffering public rather than of those enthusiasts who are inclined to ride their hobbies to extremes.

The last "fad" to which I will call attention this evening, much of the literature of which I think in a remote future will be read with mingled feelings of amusement and mortification by some, is the "implantation fad." Far be it from me to assert that a beautiful porcelain tooth with a root made of platina plate or wire can never be expected to become a part of the human frame.

Oh, no; I would make no rash assertions, for this is the age of the telephone, the phonograph and other electrical wonders, and one dare not say anything is impossible. Allow me, however, to make a suggestion. Why not have the platina root made of a single wire cut with a good strong thread and make the implantation with a monkey-wrench?

As no operation ought to be made upon the human body without careful thought as to what is best in that particular case, so I believe no dentist is justified in making experiments in which he can have no reasonable ground to hope for success. Our desire for something new is becoming so strong that we appear quite satisfied sometimes if a thing is *only* new. We are in danger of making the mistake of thinking that all motion is progress, forgetting that the boy upon his hobby horse exerts himself tremendously, but makes no advancement.

When men try to "ride a hobby," the result is often the same.

SEVERE CONTINUOUS CEPHALALGIA AS AN EARLY SECONDARY IN SYPHILIS.

BY WILLIAM BROWNING, M.D.

Read before the Medical Society of the County of Kings, June 18, 1889.

It is well known that there are forms of headache due to syphilis in its later stages, and even that the febrile period of this disease may be attended by discomfort about the head. There is, however, a well-marked type occurring in the developmental stage of the disease, where this symptom for a time overshadows all others, and for which alone

the patient seeks advice. The real cause is then often and easily overlooked. The special works on headache (Day, Wright, Hamilton) make no mention of it, and the common works on syphilis barely refer to this symptom in a general way. It is quite natural that patients who only realize they are suffering from headache should but rarely apply to the genito-urinary specialist. Van Buren and Keyes (edition of 1880, p. 550), say: "Among the pains of early syphilis, headache is prominent, often of an excruciating character, and usually worse at night." Atkinson (Maryland Med. Jour., 1881-2, viii., p. 225-8) says more directly, "It may be the first symptom of general manifestations, and is then recognized with difficulty."

This earliest form is evidently not so very rare, as the following series of cases shows:

CASE I.—Woman of thirty-five years; seen May 1, 1886, with Dr. S. E. Fuller. She has always been strong and healthy. Is the mother of several children, and is now in fourth month of pregnancy. Never subject to headache or any constitutional trouble. The head pain began three weeks since, and has rather grown worse. It is usually frontal, less about base of occiput, lately also in temples. It is not throbbing, though at times darting, and is better while reclining. It may trouble her on waking in the night, gets worse on rising in the morning, and grows severer again towards night. It then remains intense until perhaps midnight, or she gets to sleep. She is not specially troubled by dreams, and but slightly by dizziness. Exquisite pressure-sensitiveness on each side at a point 1 to $1\frac{1}{2}$ cm. above orbital arch (in line of the usual but here absent notch for frontal nerve). Appetite now on the wane. Quinine has been given in full doses, to no purpose. Bromides, chloral, cathartics, unavailing. Hypodermics of morphine, or cannabis indica internally, gave some relief.

At the time no cause could be made out, except pregnancy and a considerable loss of flesh within a few months. Soon after this she developed regular secondary syphilis, and on appropriate treatment was rapidly cured of the cephalalgia. It was found that she had been infected by her husband.

CASE II.—Spanish woman of thirty-nine years. Seen at the Long Island Hospital Dispensary, June 19, 1886. Has a family; is living with second husband. Has suffered from terrible headache for two months. The first month she had, according to her statement, a kind of chills and fever. The last two weeks she has suffered from sore throat and an increasing cough. The headache gets worse about 6 p. m. and lasts all night, though it is not absent by day. In her sleep,

according to an interpreter companion, she raves a great deal and acts as though crazy. The ache is rather beating, and involves the whole head. Lying down tends to increase it, so that she often has to get up again. Also complains of pains over the whole body. Has lost flesh. Facial expression haggard in the extreme. Lymphatic glands of neck and axilla much enlarged. Mixed treatment. Ten days later she reported that the headache commenced to improve a couple of days after beginning the medicine, and that it was now very much better. Can smile and eat once more. Not seen again. In this case the feverish condition during the first month of headache evidently represented the outbreak of syphilis.

CASE III.—Mrs. M., forty-eight years old. Seen at the dispensary, September 20, 1887. Comes on account of pain in the head, which she calls neuralgic. It has been continuous for two weeks. Never previously troubled in this way. It is worse at night. No appetite. Acknowledges having had a lump in the groin that discharged a month ago.

Was given an iodide. Reported a week later that she felt much better and had some appetite. At this time a slight rash was noticeable. Four days later specific treatment was discontinued to determine the cause of the eruption. She then developed full secondary syphilis, and was referred to the proper department.

CASE IV.—Mrs. B., thirty years old. Seen at dispensary, October 16, 1888. Comes for a terrific headache. Some soreness and pain about head for four to five weeks. For two weeks it has continued with present severity. Bilateral supraorbital pain; may affect occipital region also. General "soreness" of head.

On retiring at night it is first worse, then easier until it starts again. No rest or sleep; dreams but little. Says that "pimples" appeared on right side of privates about two weeks ago, and large red blotches over back about one week ago. Exposed parts of body as yet free. Cervical glands all large. Iodide mixture. Reported four days later as somewhat easier. Sleeps a little now. Still some tenderness over the eyes; darting pains from vertex, etc.

Acne-like blotches have appeared on face and elsewhere. Later she developed general squamous eruption of the common secondary type.

CASES V., VI., and VII. have been contributed by Dr. Winfield, from his clinic at the Long Island College Hospital Dispensary.

V. and VI.—These were both males, respectively thirty-two and forty-six years of age, in whom the cephalalgia antedated the secondary eruption.

SEVERE CONTINUOUS CEPHALALGIA.

VII.—Lizzie M., twenty years old. Gives history of initial trouble. About three weeks after arrival in this country she began to have severe headache. This lasted for three weeks, when an eruption appeared, introduced by fever. This was followed by the present trouble—squamous syphilide, mucous patches, etc.

CASE VIII.—From notes of a case occurring in the practice of Dr. Fuller:

Mr. E. H. C. contracted syphilis in fall of 1881. For a time he spared his wife, but in April, 1882, she came under treatment for ulceration of the os uteri. In May she began to suffer most excruciating pain in the head. "In spite of any and all treatment this continued. Her hair came out until eyebrows, eyelids, and the whole caput was as guiltless of hair as was the palm of her hand. Mercury and potassium iodide were pushed to the point of tolerance, but still the headache continued." Sedatives, ergot, etc., equally inefficacious. In the latter part of July it gradually grew less, and on going to the country it presently left her. Previous children healthy; is known since to have had two, both syphilitic, and both dying in infancy.

CASE IX.—Recently Curtis has reported (N. Y. Med. Jour., 1888, p. 48) a case of "very early syphilitic headache." Woman about thirty-five years old. Local ulcer cured in Charity Hospital, where it was called syphilitic. She then began to suffer from headache, about six weeks after supposed date of infection. Severe pain all over scalp, but forehead not affected. Marked tenderness on pressure. Sleep interfered with. No eruption or enlarged glands. On pushing mixed treatment the headache and scalp tenderness disappeared, but on stopping it the pain returned with tenderness over forehead and bones of face. Headache again relieved by resuming bichloride. About four weeks (?) from onset of cephalalgia, characteristic sore throat developed, a small sore like a mucous patch appeared over the urinary meatus, and two enlarged glands were found in the groin.

Doubtless a search of the literature would largely increase the list of cases. Whilst those here given are but briefly reported, and in some it is not directly stated that the cephalalgia antedated the general outbreak of the secondaries, still they suffice to demonstrate the main fact.

This form of headache is severe, prolonged, and continuous, more so than almost any other that we meet. There is no complete intermission. It is complained of as something foreign to the patient's previous experience. The whole scalp may be so tender ("sore") that the hair will be left uncombed. It is not localized to any spot or

nerve-distribution, nor even to one side, but involves the whole cranium; whilst the headaches of late syphilis are more apt to be localized. It may be attended by delirium, especially at night, though it does not otherwise present as marked nocturnal exacerbations as do later troubles. Still it causes insomnia, and is altogether very exhausting, as the haggard countenance of the patient usually shows. These cases indicate that it occurs predominantly, and in greatest severity perhaps exclusively in women.¹ At least all those seeking treatment for the headache simply, were females.

Still, all women who are thus infected do not have this symptom, even when fully aware of their disease. As to the proportion of those who do to those who do not, my experience would be one-sided.

In several of these cases the onset of this trouble seems to have antedated the outbreak of cutaneous symptoms by about three weeks. Hence, practically it may constitute the earliest secondary. This period, however, may be so much shorter that the symptom loses its importance, even appearing, as in the following illustration, with the advent of occult secondaries.

CASE X.—Man of twenty-five years. Seen March 15, 1888. Severe general headache began with first outbreak of eruption, two weeks previously. Pressure tenderness over the whole cranium. This was evidently of the same type as the preceding cases, except that the ache did not antedate the roseola.

The case given by Atkinson (*l. c.*) seems to belong in this class. Noticeable in his case also, is the absence of nocturnal increase in pain.

It is stated that in the headaches of later syphilis the development of serious lesions frequently brings relief. In the early form this does not immediately result from the appearance of other secondaries. The tenderness of the scalp and cephalalgia perhaps correspond to the tibial and other so-called osteocopic pains. But the headache, as a whole, is rather a parallel to that so frequently occurring in the developmental stage of typhoid, scarlatina, and other infectious diseases, the slower course of syphilis explaining the longer duration. It certainly represents a general condition of the head rather than any local organic affection.

¹ This is not the only way in which the sexes react differently to syphilis. Fournier, Bumstead and Taylor, (1879 p. 489), Barduzzi (1887; who also notes the co-existence of cephalalgia), and Morin (1888) all state that syphilitic fever occurs mostly in females. "Syphilitic insomnia, independent of cephalalgia, is more common in women during the secondary period" (Fournier, v. Seguin, in *Sajou's Annual*, 1889).

This specific cephalalgia is intractable to ordinary analgesics. It usually yields quickly to special treatment; though in one case it had to wear off gradually, and in the others a little time was required to effect complete relief.

Charcot (1887) believes that severe headache in a syphilitic subject associated with hyperæsthesia of the scalp, is usually hysterical rather than of specific origin, and is not controlled by antisymphilitic treatment. It is evident that his view does not hold, unless exceptionally, as in case VIII., in this early type.

As an adjuvant to direct specific treatment, especially in the later but also in the early form of syphilitic headache, I have found gelsemium valuable, whilst the digitalis group tend to increase suffering. It seems that McNaughton Jones (1881) has recommended pilocarpine, and Leroy (1887) aconite for syphilitic headaches in general. Hence, as a rule, *the symptomatic, in addition to the specific, treatment of this trouble demands the employment of vaso-motor sedatives and depressants, and forbids the use of arterial stimulants.*

It is proper to state that both the gentlemen who have so courteously aided with cases hold the same view of their etiology, etc., as that here presented.

DISCUSSION.

DR. HALL.—With regard to the paper which has been presented this evening, I would say that cephalalgia is an almost constant symptom in women suffering from secondary and tertiary syphilis.

In my service in the Massachusetts State Reformatory for Women I treated one hundred and sixty cases of cephalalgia in syphilitic women. I think my records show but three or four cases where this disturbance occurred in the preliminary stage. Later it was almost constant, usually yielding, however, to the antisymphilitic remedies.

A CASE OF TUBERCULAR DISEASE AT THE ANKLE JOINT.

BY GEORGE WACKERHAGEN, M.D.

Presented to the Medical Society of the County of Kings, June 18, 1889.

Nellie L—, a school girl, aged thirteen, native of the United States, in July, 1882, fell on the pavement, producing a contusion on the outer aspect of the right ankle. Aside from the temporary tenderness, no lameness resulted, nor was there at any time pain or other sign of inflammatory action, except swelling, until December, when an abscess

ruptured spontaneously. A physician was now for the first time consulted. He enlarged the opening, giving free exit for an abundant flow of pus, after which healing was rapid, leaving no apparent injury to the part. A year and a half later, in May, 1884, the first evidence of joint troubles associated with lameness began to develop, the gait became halting, and the ankle swollen, though still without much pain or tenderness.

The joint becoming weak, the assistance of a cane was necessary; for throwing the weight incautiously upon the crippled foot it inverted, collapsing suddenly. Associated with this tendency to inversion, movements of flexion and extension were more restricted. Several months now elapsed under somewhat irregular counter-irritative treatment, the trouble meanwhile progressing steadily.

In March, 1885, after prolonged poulticing, applied by the mother, a second abscess ruptured above the external malleolus. On the 9th of April following I was called to see the patient, and having placed her under an anæsthetic, enlarged the opening by a longitudinal incision down to the bone. The fibula was found carious in its inner anterior diagonal half for a space of an inch and a quarter. The disease had also encroached upon the astragalus, and, in scraping away the affected portion, the joint was of necessity invaded. A drainage-tube having been inserted through a counter-opening, made on the opposite side of the joint, full antiseptic dressings were applied.

There being no improvement by May 13, 1885, the lower end of the fibula having become necrotic, excision was determined upon. The periosteum being carefully preserved, two and a half inches of the fibula were removed and the wound dressed antiseptically. Although the wound healed slowly, the changes in the deeper structures were quite satisfactory, the functions of the joint being in part restored. Return to use of the limb was gradually permitted with the aid of a crutch, the patient having good use of the ankle joint for nearly twenty months.

In August, 1887, the patient called at my office and stated that there had been a slight swelling on the inner side of the ankle, which, after the application of poultices, had discharged matter; this had been the condition for several weeks.

Upon examination, I found a sinus opening one inch below and half an inch behind the tip of the inner malleolus; and a probe could be passed about two inches in an inward and slightly upward direction to the posterior edge of the tibia. The patient had no pain in the ankle joint at any time.

On September 24, 1887, an anæsthetic having been given, a curved incision, three inches long, was made half an inch behind and below

the inner malleolus, and the posterior lower edge of the tibia carefully examined. It was found carious along a small portion of its lower edge, and the diseased part was thoroughly removed with Volkmann's spoon, a drainage-tube being inserted, leading down to the bone. The drainage-tube was not entirely removed for about three months, injections of iodoformized ether being used every week, after thorough irrigation with bichloride solution, 1-1000.

The patient seems, so far, to have made a complete recovery with some motion at the ankle joint.

DISCUSSION.

Dr. SIDNEY ALLAN FOX.—I would like to know if the diagnosis of tubercular disease was confirmed by a microscopic examination of the pus for the tubercle bacillus? If such an examination was not made by the author of the paper, I should like to know if any gentleman present has ever demonstrated the presence of the tubercle bacillus in the pus obtained from these so-called tuberculous joints.

Dr. WACKERHAGEN.—Microscopical examination was not made in this case, but from my experience in tubercular affections of bone I am convinced that the portion scraped away was so decidedly of a tubercular character that I could not have mistaken it.

Dr. FOX.—My intention was not to cast discredit or doubt upon the diagnosis made in this case. The question raised by me was asked simply for information, and since it has not been answered, I think, perhaps, the Society itself needs some light upon the subject.

TREPHINING OF SPINAL COLUMN IN POTT'S DISEASE.

BY M. FIGUEIRA, M.D.

In the paper published by Dr. Richardson on resection of the spinal column, in the July number of the *BROOKLYN MEDICAL JOURNAL* of this year, and in the discussion following it, there are several points of interest to which I would like to call attention. The case reported by Dr. Richardson is as follows, viz.: A young man, twenty-two years old, was brought to the dispensary, and the diagnosis of Pott's disease of the neck was made, and tonic treatment and change of air advised. In August, three months afterwards, paralysis of the extremities commenced, and in November he came to the dispensary again, and on the 11th day of December was operated on, and died two days after. The first point to which I would like to call attention is the fact that

from the time the case came under treatment to the time of the operation and death, five months in all, no other means of treatment were used or advised besides medicines and fresh air. No mechanical means of any kind were used or advised for the support of the head and relief of the spine. Now in the treatment of Pott's disease in the lower regions of the spine—dorsal and lumbar—no one will deny the great success of treatment by plaster jackets and other mechanical means. Indeed no surgeon will try to treat such diseases without the use of mechanical means. This, that is true of the lower spine, is equally so in regard to the cervical region. And as in this region the bodies of the vertebræ are smaller, the motions more free and the ligaments looser, so the deformity from Pott's disease in this region comes on earlier, is more marked and nature has less power to relieve it; and so the need for mechanical support is here more urgent than in other parts of the spine. In the plaster of Paris jacket, supplemented by the *jury mast* with a proper support for the head, as sold by instrument makers, we have an admirable means of accomplishing this. It gives support to the head, relieves the symptoms, and rectifies the deformity by means of the extension it is provided with, and at the same time gives the patient a chance for exercise and fresh air so necessary in this disease.

I am aware that many with Dr. Rand believe that the only means of mechanical treatment of these cases is by means of extension from the head in bed. To my mind such treatment has not in it the elements of success. It confines the patient in bed, deprives him of exercise and fresh air, emaciation, loss of appetite, and bed sores soon follow, and the treatment has to be given up, with the patient in a worse condition than before. The tendency of Pott's disease of the spine is eventually towards recovery, as seen in the numbers that get well and go through life with a deformed spine, but otherwise cured. If by mechanical means we support the spine till consolidation takes place around the diseased bones, recovery with moderate displacement I believe to be the rule.

In the discussion following Dr. Richardson's paper the judgment of the surgeons present seemed to have been that operative interference is proper in cases of Pott's disease, and the opinion was expressed that in the future the operation will probably be more often resorted to.

From this I certainly dissent.

The parallelism between Pott's disease of the spine and the so-called scrofulous diseases of the joints—white swelling, morbus coxarius—is certainly evident. The tubercular nature of Pott's disease has been discussed and demonstrated by Mr. Treves, and the relation in which this disease stands to the so-called scrofulous disease of joints is well understood by surgeons.—*Scrofula and its Gland Diseases*—Treves.

Now, since Mr. Ferguson first revived resection of the hip joint, the success of surgeons in operations on tuberculous joint diseases has been brilliant and marked, and yet for all that a new school of surgeons is gradually forming here and abroad that deprecates the use of the knife in this class of diseases, and claims that by proper mechanical means, combined with medicinal and hygienic treatment, everything and more can be accomplished than by operative means.

And these views are founded on the pathological study of these diseases and on the clinical observations of their natural tendency toward recovery under favorable conditions.

Dr. Judson's pamphlet, reprinted from the *Medical Record*, May 18, 1889, embodies clearly these views.

Now if this is the case in the treatment of diseases where operative interference is comparatively successful, how much more forcibly does it apply to a disease of an identical nature, with such marked tendency to natural recovery and in which operative interference has been marked by such disastrous results as in Pott's disease.

If we examine the means by which nature cures caries of the spine we will find that as the disease destroys the bodies of the vertebræ and makes them collapse, a process of consolidation takes place between the vertebral process, arches and ligaments; the posterior part of the spine is strengthened and in time ossified, so that when the natural support of the bodies of the vertebræ is taken away by the disease the spine does not give away and separate as it otherwise would, but a certain amount of strength and support remains, and so the parts are given a chance to finally consolidate and recover.

Now by operating we destroy this very buttress by which nature helps to cure the disease, and as the disease is in the bodies of the vertebræ our chance to reach it from behind, with the cord and nerve roots in the way, is poor indeed.

An impression seems to prevail amongst some surgeons that the paralysis in Pott's disease is caused by direct impingement of the diseased bones upon the cord (BROOKLYN MEDICAL JOURNAL, July, 1889, page 413).

Now pathological research and clinical experience show this to be an error. The fact that cases of Pott's disease without any displacement develop marked paralysis, where others with extreme curvature are exempt from it; and again the fact that cases with marked deformity and paralysis entirely recover from the latter without any appreciable change in the deformity, all confirm this view.

But pathological investigation has shown that actual inflammation of the cord, or the pressure of the products of inflammation upon it, cause the nervous symptoms. Erb, in speaking of paralysis caused by

direct pressure of bones on the cord, says : "This is certainly *very rare*, and only occurs in excessive kyphosis. Enormous angular kyphosis may occur without any symptoms of compression. The kyphosis is not therefore the sole nor the *chief* cause of compression." And again : "In most cases the compression is produced by inflammatory erudation" (Ziemssen's Cyclopædia, Vol. XIII, page 321).

"Ogle, Michaud and Charcot express similar views. This explains the natural recovery of these cases, as the tendency of inflammatory products is to be reabsorbed in time, and gives an argument against the wisdom of operative interference for the relief of paralysis.

And in connection with this I will call attention to the error of those who claim that paralysis in Pott's disease generally appears as the disease is getting well and the inflammatory process has subsided (page 413 and 414, BROOKLYN MEDICAL JOURNAL, July, 1889). Not only is this contrary to the pathological evidence cited above, but reference to clinical reports of cases clearly disprove it. See page 218 Clinical Treatise Nerve Diseases, Rosenthal.

In conclusion I will submit the following propositions :

That the tendency of Pott's disease in children and the young is towards recovery and cure under favorable conditions.

That in order to help this, cases of Pott's disease, especially the cervical form, should be treated by mechanical means that will obviate displacement and give support and at the same time allow exercise in the open air.

That operative interference is of little promise, as in recent cases mechanical means are equal to a cure ; and in advanced cases, with ankylosis and paralysis, nature can be relied on to absorb inflammatory products and relieve symptoms. In a few cases where proper mechanical means, hygienic conditions, and time fail to relieve or cure, we have very little indeed to expect from operative interference.

I will only add that all through this paper I have only had reference to Pott's disease and diseases of bones and joints as taking place in children or in the young, with the exception of a few points common to all ages.

INJURIES TO THE SKULL, WITH SOME OBSERVATIONS ON ONE HUNDRED AND EIGHTEEN CASES.

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Read at the Seventh Special Meeting of the Fifth District Branch of the N. Y. State Medical Association, held in Port Jervis on August 27, 1889.

(Concluded from page 613.)

The Treatment of Skull Injuries.—Here, indeed, we come to the knotty part of our subject. While great advances have been made in surgery, during the present century, yet, notwithstanding all that has been recently published by contemporaneous writers and enthusiastic investigators, there still remains much diversity of opinion on this subject. We can hardly say that anything under this head has been *definitely* settled.

It must not be forgotten that this question was profoundly studied by the greatest military surgeons of the past; many of whom had extensive experience in the wars of their time: when the modern, rapidly-firing, breech-loading, long-range musket of modern times was unknown; when the cavalry arm of the service did terrible destruction with their broad, heavy sabres, and battle axes, on the heads of the contending foe; when the bayonet-charge was more frequent, and fighting at close quarters common—the infuriated hosts dealing death and destruction with the butt ends of their carbines.

The main part of the controversy *was, and is, on interference.* Shall the surgeon use the elevator or trephine, and elevate or remove the depressed or fissured bone?

Is the operation itself so simple and harmless, as to be unattended with danger, or followed by unpleasant consequences? And again, not less important to be considered, is the next question: Are these depressions, or fractures, *always* a source of impaired cerebral action, and their presence a menace to healthy brain-function?

I am convinced, by practical experience, that, in a general way, we may answer both questions in the negative.

The trephine is an instrument capable of doing much harm, no matter in whose hands it is manipulated. The healthy brain will safely bear considerable compression, with perfect immunity, so long as no spiculum of bone is driven into it.

We must, then, when we come to decide the question of perforating the skull with the large, modern trephine, and of even enlarging this spacious opening with the rongeur, consider what the ultimate results will be as regards this extensive mutilation. I have occasionally experienced almost insurmountable difficulties, in the *after-treatment*, when the trephine is used.

I think it well to hesitate, when there is simple depression of bone, with *no pronounced* brain symptoms, before we open on to the brain with the trephine: not that the operation is difficult or always dangerous, but that its use may be followed by that *bête noir* of brain surgery *cerebral hernia*.

We may safely predict reasonably good results after the trephine, provided the dura mater has not been lacerated; but if this tissue is divided and the convolutions disturbed, we may look out for protrusion of brain substance—a condition for which there is no remedy.

Billroth says that brain tissue does not renew itself when *once* destroyed. This may be so, but no one will deny, who has ever seen cerebral protrusions, that a soft, fungous substance, much resembling brain tissue, will grow, *and bulge up through*, as fast as it is cut off.

I have found, when the dura mater allowed this mass to pass outward, it will so push through the uniting edges of a scalp wound as to quickly tear them asunder and prevent adhesion of the edges.

As we may look for this troublesome sequela of the trephine, we should always at the primary dressing see to it, that, if necessary, the torn edges of the dura mater are sutured, *when possible*, with fine catgut; the whole well covered, and compressed till primary union is secured.

While speaking of the opening made in the tissues of the head, for the trephine to reach the bare bone, this seems the place to mention the fact that, in fractures of the skull, scalp wounds sometimes cannot be closed at all.

One cause has been stated—brain-protrusion; the other, an opposite condition, is collapse of the brain: and as neither can be successfully treated in every instance, there will be a few irremediable cases

I will here cite a case of the latter condition. My patient, a man of twenty-three, while returning from work was struck on the side of the head with a brick. Shortly afterward the same evening he was arrested and locked up. The following day a judge gave him a “ten-day sentence.” While awaiting transportation, in the district lock-up, he had a slight convulsion.

He was sent to the hospital, when it was found that he had a scalp wound over the left ear, but no fracture could be discovered.

He now took to bed, complaining of dizziness and constant pain in his head.

His bowels were moved with salines ; but the pain continued. He remained in about the same condition, except that after the first week he was about the ward most of the time.

At no time did his temperature go up above 99°. After he had been in the hospital about a month the house-surgeon, Dr. Walsh, one morning informed me that the scalp wound was not yet healed, and wished me to see it.

I found the edges of the wound inclined to retract ; and in the centre, which was quite bare, I discovered a thin seam of granulation tissue sprouting up through a fissure in the bone.

When I saw this I was quite sure there was mischief going on beneath the bone, though we found no symptoms to indicate it except this suspicious condition of the osseous tissue.

When this fissure in the bone was seen, I made gentle pressure on each side, and pus oozed through.

The small trephine was now applied, and it opened into a large abscess *outside* the dura mater. A large quantity of pus was voided by turning the head on its side, and emptying it as one would drain a jug. After being emptied, and well irrigated, the cavity was filled with warm water, with a view of estimating its capacity, when we found that six ounces were poured in before it was full.

He was permanently relieved of the headache, but the cavity has not diminished in the slightest, nor have we been able to close the opening made through the skull with the trephine.

It is now nearly two years since the accident ; the port-hole and void in the skull remain without giving him the slightest inconvenience. By gently passing in a probe, the boundaries of the cavity can be easily defined—the surfaces of the dura mater and the skull being firmly united around its base. The pulsations of the brain are readily seen through the opening.

We tried in vain to close the aperture in the skull by every kind of plastic operation ; the edges over the hole, however, would every time either retract or ulcerate, and we gave it up. I may say that the only time we *ever saw* the brain *fill* the opening up flush to the inner plate was when our man was etherized ; but as he came out of the anæsthetic, the brain again receded. This case was quite remarkable. Here we had extensive suppuration without any fever, and most decided compression without a *single* untoward symptom.

The old dictum is not without its force and usefulness to-day, viz., that we are often justified in not applying the trephine until some *well-pronounced* or grave cerebral disturbance calls for its use. It is not

enough that there is some slight compression, or even a fracture, if the latter is of very limited proportions, and there is no displacement.

Surely, this may seem strange language in these days of progressive surgery, when we read of operators removing whole slabs of the skull-walls, and exploring the compartments which they enclose, with the greatest indifference. Indeed, a casual reader would suppose it quite a simple affair, especially when we are told the removed bone can be successfully reset and firmly implanted in its former position. No one will question, that bone carefully removed with a very fine trephine, from a *young*, healthy skull, will occasionally take on vitality; or form *fibrous* adhesions with bony tissue about it; but I do deny, when the bone is crushed by *violence*, especially in *elderly people*, that this ever takes place. The chasm must remain. The trephine may wound the dura mater.

Owing to the oval form of the skull, the broad trephine is pretty certain to do this every time.

To be sure, in cutting down for a tumor, this is not of much consequence, as it must be divided anyway; but when we are simply using it with a view of elevating, it is a different matter.

Sometimes, if we do not bear in mind the great danger of brain protrusion, we may leave our patient in a condition more lamentable than when we first saw him.

The closing of the scalp wound, after perforation, is sometimes impossible. I saw, in the *Lancet* of January 26th, 1889, the report of a trephining case, by Heath, of London, in which he acknowledged he could not, by any means within his reach, close the opening. This fact is important to remember, when we consider the question of tapping the cranial vault. I cannot offer any explanation for it, except that there is nothing to support the under surface of the scalp tissue when the brain sinks away from the surface of the bone.

However, when it becomes imperative to bore the skull, it seems to me, after drainage is established, in closing the wound the tissues should be taken up, when possible, layer by layer, and sewed *separately*, the pericranium, sub-aponeurotic fascia, the aponeurosis and scalp. This, at least, would favor immediate and compact union.

I do not wish to be understood as opposed to the intelligent use of the trephine; but I do insist that the conditions requiring it be well defined before we take it in hand, and, further, to impress on those who may not be familiar with it some of its drawbacks.

The distinguished English surgeon, Bryant,¹ describes a class of brain injuries in which, without doubt, the trephine is invaluable—those in which there is no apparent injury to the cranial coverings after

¹ Bryant, London *Lancet*, July 14, 1888.

an accident; but, where in time an ostitis commences and extends towards the meninges Here a timely opening into the diploe or bone substance, in relieving tension and depleting the engorged vessels, would have a most happy effect, He advises, however, before resorting to this procedure, to freely bleed and purge.

The technique of an operation on the skull is similar to other parts of the body.

The most thorough antisepsis having been provided, the head should be freely shaved and scrubbed and shampooed, to secure perfect cleanliness. Cat-gut suture is preferable if we look for primary union. The dressings should be of such a fluffy, absorbable character as not to need removing until union is complete, unless to displace the drain or for some special symptoms.

Erysipelas, that frequent sequence of a tear in the scalp, has been banished under rigid antisepsis; and there is no lesion more satisfactorily managed now than wounds of the scalp, when they *do not* penetrate the brain.

Large hæmatomata, when it appears that their volume is too great for absorption, and they enormously distend the scalp tissues, should be freely and promptly opened, care being taken to make a free incision, so that if a vessel is supposed to be leaking its bleeding orifice may be exposed and secured.

In every instance where I have opened those large blood tumors, I have found them in the sub-aponeurotic fascia; hence the necessity of carrying the edge of the scalpel in the direction of the large fibres of the aponeurosis from before, backwards, in making the opening. In the small hæmatomata bumps the rupture of vessels is more superficial, being nearly always, in the hairy scalp, near the surface.

With an opening into the skull, by fracture, our dealing with the wound becomes complicated and difficult; but an effort should be always made to secure prompt union. The scalp makes an ample covering for the brain, in locations where considerable portions of the skull have to be sacrificed, and where the dura mater is not wounded.

A wound of this tissue, however, as I have before stated, is a most serious complication. I consider it so great a calamity that I question even the justifiability of sacrificing its integrity in exploring for cerebral tumors. This may seem extreme language. True, now and again a tumor is found and removed; and true, also, it is that the brain is now and then extensively mutilated in searching for a tumor that never existed. But supposing the tumor is enucleated, is the patient any better after than before?

Usually he will have paralysis, often convulsions, and always more or less extrusion of fungous brain tissue, which will surely shorten his life.

It would be interesting, *if all* who open the cranium and explore the brain, would give to the profession a report of these cases, successful and unsuccessful, at the time of operation and a *year or two later*.

It is always well to make a free incision into the scalp, so that we can well expose the bare bone when about to open the skull, as it gives us much more space to manipulate in, and besides the larger incision will close as readily as the smaller.

In dealing with hæmorrhage, we may use either compression or the ligature. Of the latter I can speak confidently, as my experience with it, under certain circumstances, has been most gratifying.

When compression will not suffice, and you cannot draw out and secure the mouths of the spouting vessels, and when clamps are in your way, I have used with great ease and success what may designated "the temporary transfixion ligature."

I can find no mention of this most useful expedient to the operator in any work. You simply take a single or double ligature, according to the size and depth of the vessel, with a curved needle, taking care to carry the point below the vessel, *close to the bone*, and bringing it out near to where it entered, then tying the ends sufficiently tight to stop the hæmorrhage. I use one or more, as may be required, on any kind of vessel, vein or artery, large or small.

By this means, bleeding is most expeditiously controlled, and we are permitted to go on leisurely with our operation.

When we are through, we remove the ligatures, and, if the divided vessels are small, all bleeding has stopped, and we close the wound. On the other hand, if there is a large vessel included, it gives us an opportunity to find and tie its retracted ends.

We will meet with hæmorrhage mostly in two situations, viz., external and internal to the broad aponeurosis—in the scalp tissue and in the sub-aponeurotic fascia; in the latter we most frequently encounter the bloody effusions, hæmatomata

If very great caution is not taken, the peri-cranium will be overlooked in exploring for suspected fractures. I find, in nine cases out of ten, inexperienced young hospital surgeons mistake the sub-aponeurotic fascia for it, and will claim that they divided everything down to the skull in their search, but the pericardium is yet untouched.

One who has made many careful dissections here, cannot blame them for overlooking it. The pericranium is so extremely thin and transparent that, if great care is not exercised, we will imagine we see the bare skull, while this covering yet remains intact. It requires good eyesight, as well as a concentrated light, to readily identify it.

If we wish to preserve the tissue, with a view of sewing it sepa-

rately, when we close the wound we may *sometimes succeed* if we *scrape it* up very delicately with an elevator. We will very often fail, however, no matter what care is taken, in detaching it entire.

Over the sutures it is almost blended with the bone itself, and cannot be raised without tearing. We meet with the same difficulty in regions of the head where muscles are inserted into it.

In skull fractures it is always badly torn; so that, when we hear of this being *sewed together* after these injuries, if we are profoundly skeptic, it should not be wondered at, for the reason that it is an utter impossibility in many cases. We find the osseous tissue of the skull of every consistence; in one the trephine going readily down to the meninges, while in another its hardness seems like ivory, the teeth of the instrument penetrating it only with great difficulty.

Very often we may be able to elevate depressed bone by the use of Hey's saw, or the elevator

The hæmorrhage from the diploe may be of a very troublesome kind. When this is the case, we must use pressure, or plug the vessels.

It very seldom happens, however, that more than ordinary means are required to control it. Bleeding within the cranial vault, though occasionally quite free, is seldom immediately dangerous. I have seen every square inch of the skull opened except the base and petrous portions, even over the lateral, deep, and the great, long sinus, but there was no instance in which life was jeopardized, or that firm continued pressure did not suffice to stop bleeding. In these days of antiseptics the drainage-tube is used in open wounds of the skull penetrating the brain. Where the fracture is through the vertex they do more harm than good, for the simple reason that you cannot drain a man's skull in this situation unless you stand him on his head. However, if it is desirable to keep the wound open with a view of removing all effete matter, a small twist of gauze may be passed in and changed with each dressing.

We must deal with the scalp on general principles when it is wounded.

It heals quicker than any other tissue in the body, provided all extraneous matter is removed from the wound.

Here, indeed, antiseptics work wonders.

While we are anxious to publish our success we are prone to conceal our failures; as a result, statistics are unreliable and almost worthless on this subject.

The cerebral substance is still a puzzle. Its functions have been studied and analyzed for centuries by the greatest minds in the profession; but has it yet been shown what the changes are in its organization in insanity, or how we can explain why in one instance a small

clot will induce alarming symptoms, and in another an immense effusion in the same location will develop no trouble whatever, as far as mental disturbances go?

At one time we will find that a small depression involves loss of consciousness; at another our patient walks to hospital with nearly the whole side of his head kicked in by a horse, or driven in by a blow.

A small bullet entering a frontal lobe will occasion immediate death, when at the post-mortem scarcely any hæmorrhage is found. Another has a large bail shot clear through the brain and makes a good recovery.

I believe that with the brain as with other organs—the lungs or kidneys, for instance—there is a volume much in excess of the immediate demands of the individual, and that it is entirely compatible with mental integrity, when circumstances require it, to remove a portion of healthy cerebral tissue.

In cases of laceration of the dura mater and where hernia is threatened, the procedure would seem entirely feasible, taking care at the same time to remove enough of bone, so that the scalp could fall downwards and lie snugly over the remaining portion. This would remove the tension and allow us to bring the fibrous lining of the skull together and remove any superfluity if necessary, so as to prevent possible future protrusion.

With those practicing in a large city or in mining districts, the subject of lesions of the head is one of great interest.

With us in New York, particularly, with our streets, sidewalks, yards and areas, paved with stone; with our residences of great height, especially those buildings called flats, which go heavenwards up into the sky from six to ten stories, with the elevator cables breaking, people walking carelessly into the open shaft and others falling down a few steps, we are almost daily reminded of the importance of this study.

Among our working population those injuries are very common, owing partly to their occupations as mechanics and laborers engaged in the construction of high buildings. Skull injuries are also fearfully frequent in tenement districts, where people have to dry their clothes on the housetops, and often go there themselves to escape the stifling heat in their pent up quarters of a hot summer's night. The mother leaves her little ones on the casing of the fire-escape, on the shady side of the building, while she goes about her household duties. One of the little ones gets on the railing, loses his balance, and goes towards the yard, to be picked up perhaps dead, or, if the height has not been great, with a fracture of the cranial vault. I mention height, for I find the greater the height, the more certain is the head to reach the ground first.

In falls of ten or twenty feet the extremities come first and break the force of the fall.

With our sixteen hundred thousand population and an average of more than one hundred and twenty deaths a day, I have learned through Dr. Roger S. Tracy, our excellent Registrar of "Vital Statistics," that there were, in the year 1888, six hundred and sixty-nine (669) deaths reported as having been caused directly by either falls or blows. Out of this number two hundred and eighty-one (281) were due to fractures of the skull.

If we include pistol-shot wounds of the head ending fatally (27), and those deaths following the use of the trephine—there are none of the latter formally reported—we would have more than three hundred, or nearly half, about 43 per cent. of all deaths from violence due to falls and blows followed by lesions of the encephalon.

Of the whole number of cases which have come under my observation in the 99th Street and Harlem Hospitals, there were 113 males, 5 females. Number caused by falls, 47; number of those who died, 20. Number of fractures caused by blows and missiles, 41. Number recovered, 51. Number died, 20. Pistol-shot fractures, 8; 3 recovered; 2 improved, and 3 died. Of the 29 cases entering the hospital comatose, 8 recovered and 21 died. Out of 33 entering the hospital conscious, but shortly becoming irrational, 9 died. Twenty-four were more than fifty years old; of those but 5 recovered and 2 improved; 26 were under twenty years, and of those 17 recovered and 9 died. The oldest patient was 74 and youngest 2 years; both died. Number of cases trephined, 32; 15 recovered; 8 died. Number followed by cerebral hernia, 9. Of those, 2 died later, and 2 had, leaving the hospital, epileptic fits. Number of trephine cases, followed by unclosed opening in the skull, 11.

THE SIGNIFICANCE OF THE SILVER IMAGES IN THE INFLAMED CORNEA.

BY J. H. MENNEN, M.D.

A paper read before the Brooklyn Medical Microscopical Society at their meeting, September 4, 1889.

Since Virchow's¹ celebrated treatise the cornea has been considered as a kind of connective substance made up of fibrils in which connective tissue cells are imbedded. As early as 1856 His² made the following statement: "The distinguishing feature of the cornea at the first glance of the new born or very young beings is the comparatively

¹ Die Identität von Knochen, Knorpel u. Bindegewebskörperchen, sowie über Schleimgewebe, 1851.

² Beiträge zur normalen u. pathologischen Histologie der Cornea, 1856.

large number of cells; *i. e.*, in the new born human beings we find the reticulum on the surface so dense that the meshes which are filled with intercellular substance are often smaller than the cells themselves." This observation yielded the first accurate description of the cornea corpuscles, which unite by means of broad prolongations, whose points of intersection contain large nuclei. Somewhat different was the conception of von Recklinghausen,³ who by coloring the cornea with nitrate of silver, brought into view light branching spaces, which he termed juice canals, assuming at the same time the cornea cells to be imbedded in these spaces.

After we had been informed by Cohnheim⁴ that the cornea corpuscles could be represented in violet color by a solution of chloride of gold, the prevailing opinion was that the silver and gold pictures did not perfectly cover each other, and to-day there are a number of histologists who maintain that the cornea is traversed by juice canals, since by injection of colored liquids into the substance of the cornea branched figures can be produced which correspond with the silver pictures in all essential points.

Owing to its transparency and firmness the cornea appears as an unusually well fitted object for histological and pathological research. Thus it is not astonishing that the literature of this tissue has assumed enormous dimensions. Nevertheless we have not as yet reached definite conclusions about the most important questions concerning the construction of the normal cornea. Still it is absolutely necessary to have clear ideas of the histology of this tissue in order to be able to obtain an understanding of its pathological conditions. To commence with, let us take into consideration the method of staining with nitrate of silver, which for a long time has been looked upon with distrust by eminent histologists. The earliest literature on this subject is not very rich. Alexander Rollett⁵ gives (Fig. 384) an illustration of a frog's cornea treated with nitrate of silver, in which scanty, moderately ramifying and only exceptionally connecting light fields appear upon an evenly dark ground. Somewhat more complete is the picture by E. A. Schaefer⁶ (in Fig. 331); he represents the cell spaces of a rat's cornea stained with nitrate of silver, wherein all light fields are interconnected and from the light spaces themselves numerous, partly brush-like offshoots penetrate into the dark basis substance. Opposite this figure we find an image of the cornea of a rat stained with chloride of gold demonstrating the conformity of the dark, rather violet cornea

³ Die Lymphgefäße u. ihre Beziehungen zum Bindegewebe. Berlin, 1862.

⁴ Virchow's Archiv, Bd. 38, 1867.

⁵ Handbuch der Lehre von den Geweben, von S. Stricker, 1872.

⁶ Quain's Elements of Anatomy, vol. ii., ninth edition, 1882.

corpuscles with the light silver spaces in a striking manner. L. Ranvier⁷ illustrates (Fig. 306) the cornea of a tree frog stained with nitrate of silver. He represents the light fields interconnected, with ramifications of varying calibres, thus making the fields of the basis substance appear smaller than any other author before him did. About the structure of the basis substance he knows nothing. On page 658 he says as follows: "Dans la couche profonde de la cornée de quelques animaux, les jeunes chats principalement, ainsi que l'a fait remarquer Hoyer 1865, il n'y a pas fusion complète des prolongements cellulaires. Le nitrate d'argent y dessine des lignes noires plus ou moins sinueuses, analogues à celles qu'il détermine entre les cellules d'un endothélium. C'est là un fait intéressant parce qu'il montre que les cellules fixes de la cornée fusionnées d'ordinaire par leur prolongements, peuvent cependant quelquefois conserver leur individualité"

W. Hassloch⁸ goes further than any other observer, since he maintains that the violet chloride of gold images agree in every respect with the light silver pictures. The author at the same time asserts that in silver specimens contours of the light fields are absent, inasmuch as from their edges numerous and fine offshoots emanate into the basis-substance, producing here an extremely delicate light reticulum. That which appears with lower powers as a mere granulation of the basis-substance is resolved with higher powers into a delicate reticulum. Correspondingly the dark violet corpuscles in a cornea, treated with chloride of gold are provided with very delicate offshoots, in connection with the fine network traversing the whole basis-substance. Hassloch denies the existence of juice-canals, adopting the views of Engelmann⁹ that the light spaces entirely correspond to the protoplasmic formations known as cornea corpuscles. Parenchymatous injections do not disprove this conception, since liquids forced into the tissue will squeeze the soft protoplasm against the walls of the spaces, thus bringing forth the forms of the latter, the same as the nitrate of silver staining does in which the protoplasmic spaces simply remain uncolored. The light network in the silver stained basis-substance is identical with the dark reticulum after staining with chloride of gold, and this network is considered to be the real living matter, which likewise traverses the protoplasm. Hassloch was therefore the first to declare that the basis-substance of the cornea is living in the same sense in which we have long since been aware of the life of the cornea corpuscles themselves.

This view has been ignored, evidently because it is in such a striking

⁷ *Traité technique d'Histologie*, deuxième édition, 1889.

⁸ *Untersuchungen über den mikroskopischen Bau der Cornea*, 1878.

⁹ *Ueber die Hornhaut des Auges*, 1867.

ing opposition to the cell theory and to everything hitherto known of the structure of the basis-substances generally. It is gratifying, however, to learn that a celebrated European scientist, S. Stricker,¹⁰ has accepted these views as correct, since he himself is now convinced of the life of the intercellular substances. Page 838 Stricker says: "In the fresh normal cornea the basis substance appears homogeneous. The branching cells, I once believed, ought to be there, although we do not see them. Now it is plain that this presumption was not sufficiently supported, for I have learned that the basis-substance of the cornea is as a whole a living substance, which possesses the capacity of being transformed under our very eyes into cell substance, the same as cell substance changes under the eyes of the observer into basis-substance." Page 843 he says: "All my latter observations force me to the conclusion that the hypothesis of the existence of juice canals was altogether erroneous. We have seen juice canals only by resorting to the silver stain. This does not teach us whether the light ramifying fields are spaces in which the cells lie, or whether the spaces represent only moulds of cells, which may have had quite a different configuration before the coloring, at the moment of death. The above described transformation of basis-substance into wandering cells and *vice versa* of wandering cells into basis-substance as well as the comparison of specimens prepared at different seasons disclosing changes of the form of the branching cells, is incompatible with the hypothesis of juice canals." Stricker has, with this statement, adopted the views of C. Heitzmann,¹¹ who first described the minute structure and first maintained the life of the basis-substances. Stricker, on page 844,¹² states, that since he acknowledges the life of the connective substances, he has lost the understanding of their significance. It seems, however, that this difficulty is not so great as to render the question an insoluble one. The basis-substances serve for supplying the tissues with firmness, bestowing upon them, as it were, a certain, oftentimes even considerable degree of consistency. The cornea, tendons, aponeuroses, cartilages, etc., are obvious illustrations of this assertion. Still more striking is the significance of the basis-substance of tissues, wherein deposits of lime salts take place, such as bone, dentine and enamel. Life is by no means a property adhering to the basis-substance in a diffuse manner, to all its constituent parts. The properties of life are evidently bound to the living matter proper, which we know to-day of all tissues of the animal body, traverses the basis-substance in the shape of a reticulum. All this, it is true, holds good for the protoplasm too,

¹⁰ Vorlesungen über allgemeine u. experimentelle Pathologie, 1883.

¹¹ Untersuchungen über das Protoplasma, 1874.

¹² *Loc. cit.*

but the main difference between protoplasm and basis-substance is, that in the former the interstices of the living network contain a liquid, whereas in the latter we find a nitrogenous semi-solid or solid substance. This filling material varies in the tissues in its chemical composition, without being morphologically different. We consider only those minute interstices of the basis substance inert, that lie between the formations of the living matter proper and differ chemically in various tissues. These meshes may be compared with paving stones, the interstices of which are filled with living matter instead of sand or mortar. According to this view the living matter is a continuum throughout the entire animal or vegetable body, whilst the filling matter in the different tissues exhibits chemical differences and owing to these properties gives to the tissues its particular character.

My investigations on the cornea have led me to the conviction that Hassloch's description and views, announced at first in 1878, are correct. In order to obtain a clear understanding about the changes due to inflammation, I deem it advisable to describe once more the normal cornea, and will confine myself solely to preparations of the cornea of the cat, stained with nitrate of silver and split into the thinnest lamellæ possible. The splitting is facilitated by a previous treatment with dilute lactic acid. That the negative silver specimens correspond in all their essential points with the positive gold images, I can confirm by my own observations on the cornea of the cat and frog. I am in the position, however, to make a few new statements concerning the silver images which, I am sure, will render the process of inflammation more comprehensible.

When we study a lamella of a cat's cornea stained with nitrate of silver with a good immersion lens, of about 1,000 diameters, we will see an abundance of details that previous to Hassloch have escaped the attention of all observers. (See Fig. I.) In order to obtain the image represented in the drawing in perfect clearness, the following precautions cannot be dispensed with. To the cornea of a middle-aged cat we apply a solid stick of nitrate of silver for a few minutes, the animal having just been killed by strangulation or under a glass-bell by means of chloroform. Immediately afterward the cornea is cut out with a curved pair of scissors, placed in a solution of lactic acid (about 15 per cent), and exposed to broad daylight. After a few days it has assumed a dark brown hue, and by means of two delicate forceps it can be easily split into extremely thin lamellæ.

These ought to be perfectly free from granular precipitations, and to be so thin as to contain but two layers of cornea corpuscles. The specimens must be dark brown, since the light-brown ones do not bring the structure of the basis-substance into view with sufficient

clearness. Preparations preserved in glycerine can only be made use of, because when Canada balsam is employed the finest details will be lost in a short time on account of its high refracting power.

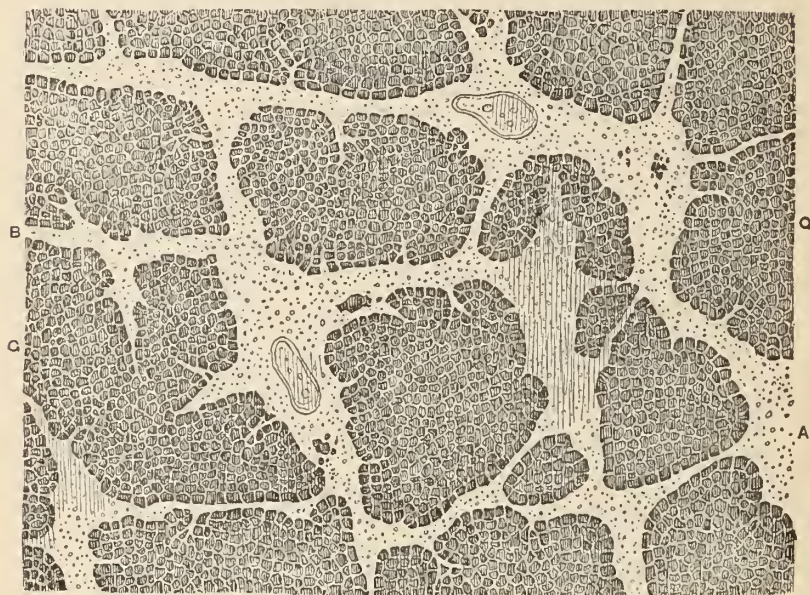


FIG. I.

NORMAL CORNEA OF CAT STAINED WITH NITRATE OF SILVER. $\times 1,000$.

A. Large light fields corresponding to the protoplasmic corpuscles.

B. Broad offshoots.

G G. Dark brown basis-substance traversed by a delicate light reticulum.

We see the well-known light ramified routes in all the lamellæ. The largest light fields show oval, pear-shaped or bluntly triangular nuclei, of a pale grayish color, just discernible as such, since the silver leaves all the protoplasmic formations unstained. In all my specimens, without exception, ramified light routes could be seen exclusively, interconnected by means of light offshoots. These contain, here and there, dark brown, globular or angular patches that are certainly not to be considered as precipitations of nitrate of silver. The periphery of the large light fields, as well as of their offshoots of whatever calibre, is marked by a somewhat darker brown color, and is pierced by innumerable fine, unstained offshoots, entering into the light reticulum that traverses the brown basis-substance. The colorless routes are, therefore, not only interconnected by broad offshoots, but also by a delicate network. Haploch in describing this structure for the first time, represented the brown fields several times their diameter. Even

in my drawings, I believe, the brown blocklets are a trifle too large. This may be pardoned in the face of the fact that these blocklets are so small that even the most skilled artist's hand might not do justice to the neatness of the microscopical image. Indeed, the first impression of the basis-substance under the microscope is that of a delicate granulation. It is only by a continued close study, particularly in places, where the finer light offshoots split in a brush-like manner into the very finest, that we obtain the appearance of an extremely delicate network within the brown basis-substance. Even the finest rays bursting forth directly from the light routes might easily be overlooked by examining a specimen that is either too thick or too lightly or deeply stained.

As I have stated before, Hassloch has proven that the large light routes and their offshoots entirely correspond to those protoplasmic formations which we know by the name of cornea corpuscles. In cornea specimens stained with chloride of gold, which had been exposed for some days to the influence of dilute lactic acid, either before or after staining, we see the violet, branching nucleated cornea-corpuscles in exactly the same shape and arrangement in which they appear in the light routes of the silver image. The protoplasmic bodies are traversed by a very delicate, dark violet network, which represents the living matter proper. Such a dark violet reticulum also penetrates the light violet basis-substance, and perhaps the only difference between the network of the protoplasmic bodies and that of the basis-substance is, that the interstices of the former are perceptibly smaller than those of the latter.

From what we know of the chemical coloring action of both the nitrate of silver and the chloride of gold, we are entitled to the statement that the light reticulum of the basis-substance in the silver image is identical with the dark one in gold specimens. Thus we are enabled, by means of these reagents, to readily demonstrate the living matter of the basis-substance in a satisfactory manner. One point especially deserves mention and, in my judgment, must be laid stress upon, namely, the presence of dark brown fields and granulations in the light spaces of even the most perfect silver images. Having become acquainted through Stricker with the remarkable form changes of the protoplasmic bodies in the normal as well as in the inflamed cornea, we have to dispense with the idea of the so-called fixed cornea cells, in contradistinction to the wandering. In the living cornea there is nothing *stable* and nothing *fixed*. What appears in one moment as protoplasm can, a few minutes later, be basis-substance, and *vice versa*. In this conception of things we may, without hesitation, look upon the small dark brown particles within the protoplasm as newly built or retrogressed basis-substance.

This idea will be of assistance in understanding the inflammatory images, where basis substance is dissolved in large quantities and, in part at least, newly formed again. The fundamental conception, that basis-substance is chemically modified protoplasm and may return any moment by means of a chemical transformation or dissolution to the protoplasmic condition, will help us in satisfactorily explaining the inflammatory images.

If we wish to study the earliest stages of keratitis, we must excite inflammation on living animals either by a chemical or mechanical irritant. For this purpose, as Stricker¹³ in 1874 has already announced, the cornea is a most valuable object, and the rod of nitrate of silver serves both for coloring of the cornea and, at the same time, as an irritant to bring forth inflammation. We chloroform the cat under a glass bell, and as soon as she becomes unconscious, a sharply-pointed rod of nitrate of silver is bored in rotating movements into the centre of the cornea without, as a matter of course, producing perforation. After twenty-four hours the cat can be killed, the cornea cut out with a pair of curved scissors and placed in a dilute solution of lactic acid, whereupon it can be split in a few days into lamellæ just as easily as in the normal state. A certain portion of the cornea has been destroyed by the nitrate of silver, and having become necrotic is, as a matter of course, unfit for examination. In the vicinity of the necrotic spot we readily recognize the characteristic changes of the cornea corpuscles in their relation to the light silver fields. On an average the inflammation is found to be most advanced in the immediate neighborhood of the scab, whereas towards the periphery the inflammatory changes are less marked and here bring to view the earliest stages of inflammation. The inflammatory changes are, however, by no means uniformly distributed throughout the whole thickness of the cornea. Some lamellæ show beautiful inflammatory pictures, others, on the contrary, less striking changes. Toward the periphery of the cornea we meet, as a rule, with little or unchanged fields, which disproves the assertion of Cohnheim that the inflammation, even though produced by central irritation, invariably starts from the periphery and advances toward the centre. It is superfluous to combat this hasty assertion, since in late years Cohnheim himself admitted his mistake.

In order to obtain a full understanding of the inflammatory images, it seems to be advisable to establish certain stages of the process. Such a division into stages is useful only for the comprehension of the chronological development of the inflammatory images, but, as I have already stated, is by no means in a topographically correct relation to

¹³ Untersuchungen über den Eiterungsprocess. Wiener Med. Jahrb., 1874.

the inflammatory focus. The division into stages serves merely to facilitate my descriptions, since the stages gradually blend with one another, without sharp lines of demarcation.

As the first stage of inflammation I will designate in accord with the venerable cellular pathology, the swelling or enlargement of the cornea corpuscles. (See Fig. II.)

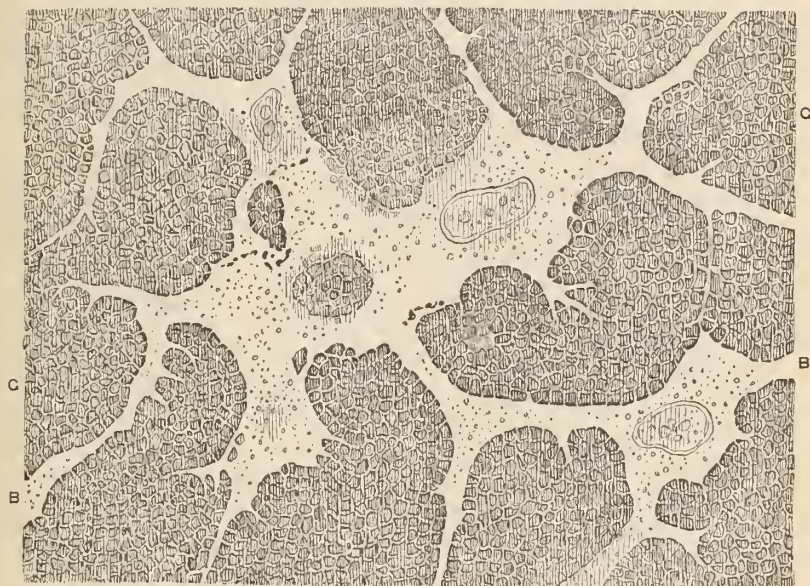


FIG. II.

INFLAMED CORNEA OF CAT STAINED WITH NITRATE OF SILVER. FIRST STAGE.
+ 1,000.

The central light field is enlarged, some of the brown fields of the basis-substance diminished in size.

B B. Not enlarged broad offshoots.

G G. Dark brown basis-substance, traversed by a delicate light reticulum. The brown fields become, here and there, paler and finely granular toward the light routes.

We invariably meet at some distance from the necrotic spot with images of uniformly enlarged routes. Of such enlargements we become sufficiently convinced, by comparing the inflamed with normal cornea specimens. Highly instructive are especially such images, in which single light fields are widened, whereas most of their offshoots show no perceptible change. Such a field has been selected for illustration.

How shall we explain the enlargement of the cornea corpuscles? The cellular pathology already assumed a swelling of the cells as *first stage* of inflammation, before a multiplication of the nuclei or cells can

be established. Is it possible that cells imbedded in an extremely firm basis-substance, such as bone cells, cornea cells, tendon cells, etc., could enlarge without a change in the consistency of the surrounding basis-substance, respectively a liquefaction or dissolution of this substance? Stricker, in his above-quoted treatise, has already called attention to this fact. In the sense of previous histological views, at least of a majority of investigators, one would say the protoplasm is enlarged or swollen, this being possible only by a dissolution or liquefaction of the basis-substance. In the silver image such a process manifests itself as a lighter coloring around the protoplasmic bodies, as represented by Stricker in his woodcuts, 2, 3, and 4, *l. c.*

To-day, on the contrary, since we know that the basis-substance is traversed by living matter, our conception about the enlargement of the protoplasmic bodies becomes much simplified. We say: the solid blocklets of the basis-substance have dissolved in the neighborhood of the protoplasm, obviously through the presence of a chemical, thus far unknown agency, whose formation depends upon the intensified nutrition, which is now generally admitted to be the inflammatory process. The dark brown blocklets have become light brown, the delicate light network has broadened, and when the liquefaction is fully accomplished, new protoplasm will appear in place of the former basis-substance, not stained any more by nitrate of silver. The light fields corresponding to the protoplasmic masses have, therefore, become enlarged at the direct expense of the basis-substance. The central light field in Fig. II. shows on the upper periphery such a fading of the basis-substance. We also see in the centre of the light route a roundish brown field, conspicuous by its pale color at the periphery, and directly passing into the protoplasm, without any sharp boundary line. At the same time small brown blocklets have made their appearance in the light spaces, being arranged in an irregular zigzag line. They do not form a continuous line, but are separated from one another by more or less broad light interstices. The study of the further stages of inflammation teaches us that we have before us a formation of new boundary lines of basis or cement substance, which, appearing later on a much larger scale, leads to the breaking up of the protoplasm. A multiplication of nuclei cannot be demonstrated in the stage of swelling.

As the second stage of inflammation I should like to designate that one, in which the broadening of the light fields has increased; at the same time a decided multiplication of nuclei has taken place, and the breaking up of the protoplasm into smaller pieces has likewise made progress. (See Fig. III).

The dissolution of the basis-substance has advanced in this stage to such a degree that a comparison with the normal cornea (Fig. I.) at once exhibits a striking diminution of the bulk of the basis-substance. Consequently, the light protoplasmic spaces have gained in circumference, not only the large light routes, but also all their broad offshoots. In places where such a broadened light field is bordered by

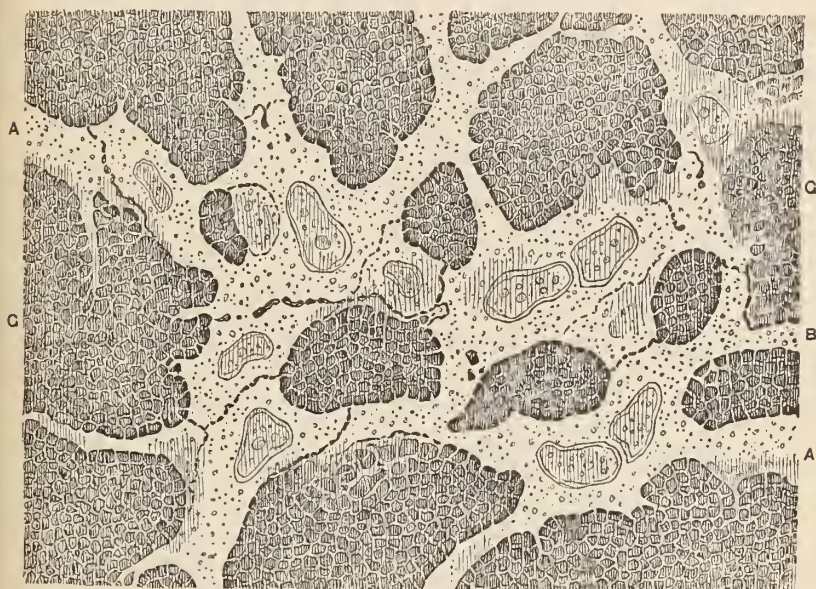


FIG. III.

INFLAMED CORNEA OF CAT STAINED WITH NITRATE OF SILVER. SECOND STAGE.
+ 1,000.

A. Broadened light fields with multiplication of nuclei, corresponding to protoplasmic corpuscles.

B. Widened broad offshoots.

G G. Dark brown basis-substance traversed by a delicate light reticulum. The brown fields become paler in some places toward the large light routes.

unchanged basis-substance, the periphery is made conspicuous by a deep dark brown color, much more pronounced than in the normal silver stained cornea. On the other hand wherever the basis-substance liquefies, the brown blocklets are seen losing color, the light reticulum between the blocklets is broadened, and the transition of basis-substance into protoplasm is, as far as the fading of the brown color is concerned, a very gradual one. The granules within the light fields, which in the normal silver-stained specimen are exceedingly faint, appear now more marked and numerous. The nuclei, which in the

normal state are visible only in scanty numbers and in the broadest light fields, are now augmented to such a degree that many of the large fields contain two and even more nuclei. The size of the nuclei also, compared with the normal state, has become changed. At the same time a certain number of dark brown lines are seen, which penetrate the light fields in different directions, and in the centre between two new dark lines one nucleus can, as a rule, be demonstrated. Looking sharply upon the dark brown lines, it becomes plain that they form a continuum only, if they are comparatively thick or bulky. As long as the lines are delicate and pale brown, they appear dotted and composed of larger and smaller brown pieces, between which we are able to recognize uncolored interruptions. In 1874 Stricker had already called attention to the presence of such brown lines in the larger light fields, but all his figures represent them as continuous, though here and there knotty, and of different thickness.

Concerning the significance of the brown lines, Stricker declares that they denote a splitting up of the protoplasm, and interconnect the newly appearing inflammatory corpuscles. In his "Pathology" (p. 391) he says, "In the normal cornea a light network on a dark ground is seen in silver specimens. In inflamed corneæ, however, there are places, around which the images are yet normal or nearly normal; advancing toward the centre of such a place the routes of the network become granulated, and are divided by brown streaks into larger segments; then they commence to swell, the basis-substance becomes scanty, the separation advances, the divisions become smaller, finally the basis-substance has totally disappeared and the corneal tissue has become a heap of cells."

Can the history of any tissue be clearer? The question of the origin of the brown lines I must leave untouched, because it can only be solved by chemical means. Also the question, why? To all appearance it denotes a splitting up of the protoplasm into indifferent or embryonal nucleated corpuscles, from which the cornea has its origin the same as any other tissue.

From this point of view the idea that the inflammatory process is a return to the embryonal state is justified. This view first originated with Stricker in the latter part of the seventh decade, and is, I believe, the only correct one.

As I have said before, the brown lines are traversed by light cross lines. What is the significance of these latter, which have so far been overlooked? The question can be answered by the study of gold specimens, where the delicate dark violet spokes which perforate the ledges of the cement substance, in the same manner as the so-called 'thorns of epithelial formations, are recognized. These spokes, threads, or

thorns are formations of living matter. Their presence shows that the connection between the split-up protoplasmic masses is not an indirect one, dependent only on newly formed cement substance, but a direct one, established by bridges of living matter.

In regard to the increase of the nuclei, I cannot make any positive statement, since the staining with nitrate of silver is favorable neither to the study of protoplasm and nuclei nor to their karyokinesis.

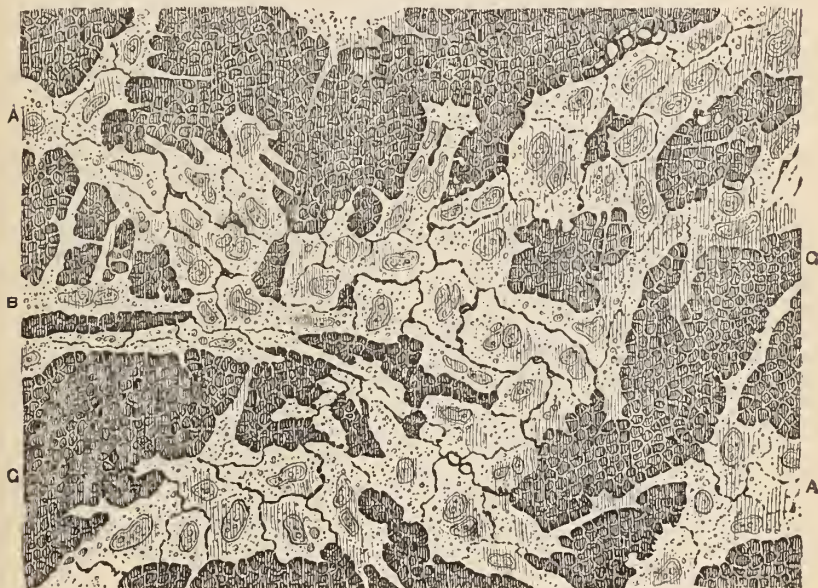


FIG. IV.

INFLAMED CORNEA OF CAT STAINED WITH NITRATE OF SILVER. THIRD STAGE.
+ 1,000.

A A. Considerably broadened light fields split up into a number of nucleated lumps.

B. Widened broad offshoots, likewise split up and nucleated.

G G. Considerably reduced dark brown basis-substance with transitions to protoplasm.

The *third stage* of inflammation is that in which both the broadening of the light fields and the melting of the basis substance has advanced somewhat further. To this stage the inflammation around the eschar has already progressed twenty-four hours after cauterization with nitrate of silver. (See Fig. IV.)

The basis substance has been reduced to a minimum. It is much paler than in the second stage, so much so that its scanty remnants have assumed a spotted aspect, with all possible transitions from dark

to light brown and a hardly perceptible fading toward the light fields themselves. The demarcation of the latter fluctuates from a deep dark brown to a complete absence of a transitional color. Within the light fields and all their offshoots we meet with numerous newly formed brown lines, by which they are divided into a large number of smaller, as a rule angular, and sometimes roundish fields. The size of the latter varies from that of indifferent or embryonal corpuscles down to the smallest recognizable light fields. All corpuscles are coarsely granular, and most of them contain one or even two nuclei, whereas the smaller fields are without nuclei.

Again I must emphasize the fact that the dark brown lines will appear continuous only, if well stained and of deep dark-brown color. The fine brown lines are made up, without exception, of small blocklets or granules. We have to bear in mind that these interruptions are of great biological importance, as they prove that the inflammatory corpuscles arising from the original protoplasmic masses of the cornea, remain in living interconnection.

In all stages of inflammation—viz., in all inflamed lamellæ—instead of broad and branching light fields, we meet with such that are apparently isolated, and these range in size from fragments of light fields down to the circumference of colorless blood corpuscles and even smaller than that. The offshoots of these segments are differently shaped, but short, and only slightly ramified. Such corpuscles are surrounded by dark-brown basis substance, and by this are apparently isolated. On looking closer, however, we find the dark-brown lines traversed everywhere by delicate light interstices, which enter into the light reticulum of the basis substance.

These are obviously the "wandering cells" of von Recklinghausen. In 1883 Stricker has already denied their character. He says that in the living cornea the protoplasmic corpuscles do not migrate; for they neither send any prolongations forward nor do they draw in any from behind, as is the case in every wandering amœba or every living colorless blood corpuscle. Anteriorly light protoplasmic offshoots arise in the basis substance, while posteriorly the offshoots simply fade and again become basis substance.

Stricker compares this process to a piece of wax spread out upon a plate under which an alcohol lamp is slowly moved. Where the heat is most intense, the wax melts, whereas the cooled-off portions soon become hard again. What is already seen in a limited degree in the normal living cornea, is in the inflamed cornea a grand spectacle of a continuous change in the aggregation of the tissue. Basis substance becomes protoplasm, and protoplasm again basis substance, such a change taking place within a few minutes. This is plainly

shown, in Fig. V., with a magnifying power of 1,000 diameters, the specimen being colored with nitrate of silver. It is for the first time that the so-called "wandering cells" have been successfully fixed by means of this method. A brilliant confirmation of Stricker's assertion indeed! The small light fields are pure protoplasm, remaining untouched by nitrate of silver. From these fields start broad offshoots,

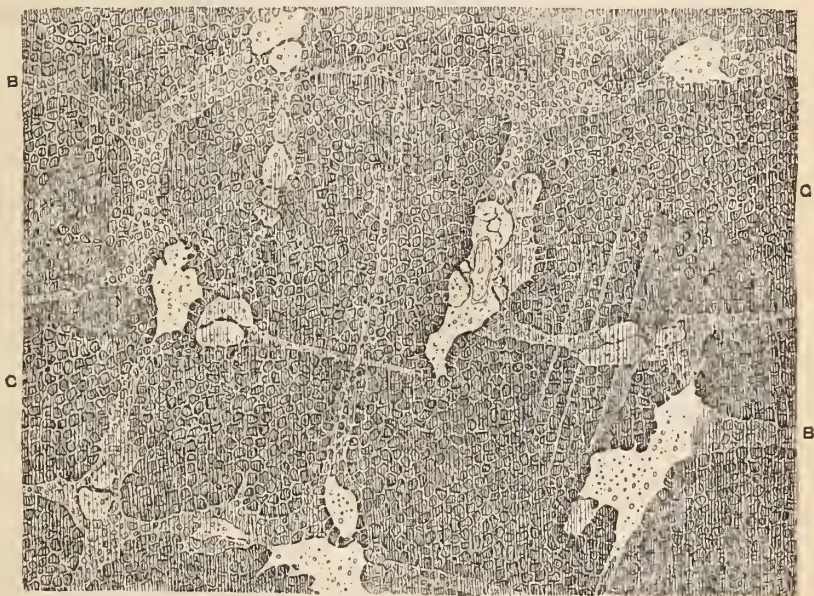


FIG. V.

INFLAMED CORNEA OF CAT STAINED WITH NITRATE OF SILVER. $\times 1,000$.

Light fields of so-called "wandering cells." Transition of protoplasm into basis-substance, and *vice versa*.

B B. Broad offshoots transformed to basis-substance.

G G. Dark brown basis-substance.

which, in their direction and diameter, correspond pretty nearly to the normal conditions. The difference, however, is that these offshoots do not appear light, but light brown and coarsely granular, owing to the fact that they are just commencing to be transformed into basis substance. In the offshoots the light reticulum is recognized, though perceptibly broader than in the surrounding dark brown basis substance. In the illustration we see, as far as this can be represented without coloring, all transitions from a light to dark brown shading, according as to whether the transformation of protoplasm into basis substance has only just begun or is already completed. Since the perfectly light fields are nothing but fragments of the normal cornea cor-

puscles and always visible within the original coarse network of the protoplasm, the logical deduction is that we are dealing with a, comparatively speaking, quick transformation of protoplasm into basis substance, and *vice versa*. In a fresh inflamed specimen this fluctuation, at the first glance, unquestionably gives the impression of an amœboid locomotion. Stricker rectified the error of all former investigators, and the classification of the cornea corpuscles of von Recklinghausen into wandering and fixed cells must consequently be abandoned.

As the *fourth stage* of inflammation we have to denote the suppuration of the inflammatory focus. For my object, however, it was not necessary to go into the study of this process. Moreover, where pus is once formed, the tissue is destroyed, and as such is not any more subject to histological research. From what has been said, it is clear that the pus corpuscles are nothing but indifferent or embryonal corpuscles, into which the protoplasm of the tissue has broken down—broken down after a perfect separation of the split-up corpuscles, both in the cement substance and in the connecting filaments. As long as the microscopists could only prove the presence of continuous brown lines of cement substance, the theory of a breaking up into individual cells was admissible. For this reason Ranvier and Hoyer have spoken of individuals not only in the normal, but also in the inflamed cornea. The moment it was proven that the brown lines are pierced and the broken-down lumps therefore remain in living connection, the idea of individuals is inadmissible. Such individuals only appear after the living connection is torn, but then we are dealing with the formation of pus. Pus corpuscles are, therefore, isolated protoplasmic particles arisen from separation of the originally connected inflammatory corpuscles. Can the history of any tissue be clearer? I would ask once more with Stricker.

The assertion made by Cohnheim in 1867, that the whole inflammatory process depends upon a migration of colorless blood corpuscles, must be looked upon as lacking scientific proof. It is astonishing that the majority of German pathologists have for twenty years recognized this view as correct and ignored all said by Heitzmann and Stricker. Only lately there are important objections raised against the error of Cohnheim and his pupils in Germany. They begin to return again to the doctrine of cell division and cell proliferation according to Virchow's views. Especially Prof. Grawitz in Greifswald has recently spoken against the migration theory. How unsatisfactory the doctrine of cell proliferation is, we shall only appreciate after the conviction has become a more general one, that not only the cells of a tissue do live and proliferate, but the basis substance also, just as the cells themselves.

How long will it be before the pathologists acknowledge this view as correct? The outlook for this is rather gloomy, considering the fact that for twenty years the theory of migration has almost completely ruled the doctrine of inflammation.

Though not much of importance can be added to Stricker's assertion concerning the theory of keratitis, I believe I have contributed somewhat toward the understanding of it, since I could show that in formation of inflammatory corpuscles not only the protoplasm participates, but also the living matter stored up in the basis substance. As long as the inflammatory corpuscles remain connected with one another by means of living matter, the inflamed cornea tissue has not ceased to be a tissue. From this either pretty normal tissue may result, or the formation of a new and transparent tissue, which we term cloudiness or cicatrix. Not until the inflammatory corpuscles separate from one another, suppuration or formation of abscess results.

Pus, however, as has long been recognized, is no tissue, and unable to form tissue. In no stage of inflammation of the cornea, where the inflammatory process is located in the centre, does the migration of colorless blood-corpuscles, in the sense of Cohnheim, play any part whatever.

BROOKLYN SURGICAL SOCIETY.

June 6, 1889.

Subject for Discussion, "Methods of Administering Anæsthetics."

The discussion was opened by Dr. Wight, who said :

The subject for discussion to-night is one of very great importance and interest. It is the administration of anæsthetics. And this matter is not as simple as it may seem to be. When the attention of many surgeons has been given for the last few years, as it has, to this subject, we are quite safe in concluding that improvements are needed—if it is possible to make them. For many years I had given the administration of anæsthetics almost entirely into the hands of my assistants. Finally my attention was called more forcibly to the need of making some improvements. And for two or three years I have been carrying out some rational experiments, having certain objects in view.

These objects may be enumerated and described as follows: 1. An apparatus should be so constructed that the mouthpiece can be detached and thoroughly cleaned, after using it for one patient and before using it for another. This point I regard as of great importance, for it would be easy to convey the germs of disease by means of an unwashed and dirty mouthpiece. 2. An inhaler should have

valves, so arranged that pure air and pure ether vapor can be inspired by the patient, and that the products of respiration can be expelled directly into the air. 3. A point of prime importance is this: the inhaling apparatus must be so constructed as to prevent the ether from running down into the patient's mouth and nose. 4. The inhaler must furnish a large evaporating surface and admit an abundance of air, so that the air and ether vapor will be thoroughly mixed by diffusion before entering the lungs of the patient. 5. And the apparatus must be so arranged that it can be used with the patient in the various positions required by the surgeon.

I will not detain you by an account of my series of experiments, but will hasten to describe the result I have reached. The receiver is an upright metallic cylinder $4\frac{1}{4}$ inches in length, $2\frac{3}{4}$ inches in diameter, and one-half inch above the bottom is perforated by a tube $\frac{3}{4}$ of an inch in diameter. This tube contains one of the automatic valves, and projects outward to receive the jacket of the inhaling tube. It also projects inside of the reservoir left at the bottom to catch any superfluous ether which may run down through the evaporator. And this tube and two metallic pins prevent the evaporator from descending below its proper level. The evaporator is a complete hollow cylinder, $2\frac{3}{4}$ inches in length, and has a diameter that will nearly fill the receiver. And the evaporator is slotted after the manner of the Allis' inhaler, in or near all sides, for the purpose of holding a roller bandage as it passes to-and-fro, and is finally wound around on the outside so as to completely fill the receiver. A cap fits the top of the receiver, and is kept on while the inhaler is not in use. The jacket which connects with the receiver is soldered to the tube that fits into the mouthpiece, and this last tube containing an automatic valve which permits the escape of the products of respiration and prevents the ingress of air. This valve is protected by a cap, into which are cut two openings through which the expired air is expelled.

I have used this inhaler in about forty cases already, and, as far as I can now judge, it meets the indications previously pointed out. It operates quickly, safely, and thoroughly, and does not leave the patient in a stupid condition. It has joints that permit the mouthpiece, as well as the receiver to be so moved that the patient can be put in any position that the surgeon requires. In case it is not easy to etherize a patient, the hand or a towel can be held or laid over the evaporator so as to diminish the quantity of the air and increase the quantity of ether vapor. And it can be used for children and babies by clamping the mouthpiece with a small pair of forceps in such a way as to make it of the proper size.

And now I wish to make some remarks on the question of ether-

ization. They are suggested by long years of experience. I have often seen peril come to a patient from the dropping of liquid ether into the larynx. This is an accident that the most expert cannot always avoid with the use of cones and their substitutes. An inhaler that causes the patient to breathe over and over the products of respiration must entail the elements of danger. Yet the carbon dioxide of expired air will aid in producing anæsthesia. But it ought to be avoided. I have often been impressed with an effect, not unlike shock, produced upon the nervous system by the rapid action of an anæsthetic—even ether. The time of the surgeon may be valuable, but the life of a patient is more valuable still. And so it is not desirable to etherize a patient too rapidly, nor is it to be recommended. On the other hand, the prolonged action of an anæsthetic has a depressing effect on the nervous system: and too much time ought not to be taken to render a patient unconscious. After the first stage, that of irritation, has passed, the patient may be more rapidly anæsthetized. But we may always remember that the patient must be approached gradually and gently as possible with anæsthetizing vapor. One learns by experience, and knows not why it is so, that patients differ as to their susceptibility; some are easily and quickly anæsthetized, and some are not. About some patients we are anxious; as to others we have no fears. And what is more, I have known patients to act in the most desirable manner under an anæsthetic at one time, and at another I have been obliged to postpone an operation for fear of impending fatality. And then we must not forget that we have been careless to some extent in entrusting the administration of anæsthetics to unpracticed hands. It is a matter of prime importance, and there are many and cogent reasons why they who are to do this work should have a careful and thorough training. It is one of the essentials of good surgical work, and its systematic neglect brings responsibility and perhaps disaster that are avoidable.

Dr. PILCHER—I understand the discussion is upon the general subject of the administration of anæsthetics. This is a subject upon which many of us have had an opportunity from time to time of expressing ourselves. Personally I have very little to add now to what I have stated at various times before.

The experience of the past ten years has led me to give preference to that very popular and common inhaler known as Allis' inhaler, of which the one just shown by our President is a modification. Although the Chairman is hardly willing to accept this as a modification of that, yet, nevertheless, it seems to me that the essential principle of this is the manner in which a surface is provided for, the mixture of ether

and the atmosphere, which is the leading feature of the Allis inhaler. The one now before us is unquestionably an improvement in the manner in which the danger of dropping portions of the ether through the meshes of the evaporating surface into the nostrils or mouth is provided against. And the mouthpiece which is attached to it of course has its conveniences from the standpoint of cleanliness. This particular inhaler is certainly convenient, and has a decided advantage over the inhaler to which our attention was brought some years ago by our lamented colleague, Dr. Thallon, as the device of Dr. Skene. It is much more manageable and less likely to get out of order, and it does not suggest itself as so formidable a piece of machinery as that. Whether in the long experience there will be a recurrence even upon the part of the one who presents this one to us, to the simpler form of inhaler or not, is a matter which time only can show; but I have noticed in other inhalers that they are frequently laid aside after a time by those who first invented them, and they return again to more simple methods.

Practically, for the administration of ether, it has seemed to me that the simple cone of Allis, used with that intelligence and care which ought to accompany the administration of an anæsthetic always, gives us all we desire, with the one exception of not being economical of the anæsthetic. It is true, I have seen the anæsthetic poured through it on to a patient, which ought not to be, and need not be. Of course a recent graduate, though a fool, will not err in this way in the use of ether with this instrument presented by Prof. Wight; he couldn't pour the ether into the mouth of the patient if he should try. Certainly this is an advantage if to such hands the giving of an anæsthetic must be entrusted. I certainly like this instrument. It seems as simple as anything of the kind can possibly be and answer to the indications. That which was presented to the County Medical Society the other evening by Dr. Burge had many of the features which this has. Whether the use of the transparent globe for the receiver, as in Dr. Burge's instrument, is really an advantage or not, I do not know; it certainly is a very pleasant feature of an instrument to have everything exposed to view.

I am convinced that in a very considerable portion of cases the use of ether as an anæsthetic is dangerous, and have been rejoiced to see the tendency, which is so marked in the profession at present, to study the advantages and dangers of different anæsthetics with regard to different patients, and to suit to particular patients the anæsthetics which experience shows to be the best adapted for them; so that there is rapidly becoming less partisanship with regard to this or that anæsthetic. It is a marked feature, for which I think all thoughtful sur-

geons should rejoice, in the conditions of to-day. The long administration of ether is certainly depressing. Even the short administration of ether has a more or less irritating effect upon the respiratory passages. Ether to any considerable extent has also an irritating effect upon the urine-secreting apparatus, and it is certainly wise for us to take these things into account in choosing our anæsthetic; and if for any reason we feel we must use ether as an anæsthetic, it seems especially wise that we should take advantage of some such device as this which has been presented to us this evening, which would diminish as much as possible the irritating effect of that particular anæsthetic.

In many cases I am convinced that chloroform should be used as the anæsthetic rather than ether; in all cases where there is recognizable irritation of the bronchial and pulmonary tissues, also where there is a diseased condition of the urinary secretive apparatus; that in young children, likewise, who as a class have been shown by experience to be peculiarly pleasantly affected by chloroform, it should be used; and at the other extreme of life, in the aged, who as a class either already suffer from or are on the verge of renal and pulmonary degenerative changes.

Now, as to the methods of administering chloroform: The most convenient and safe inhaler is always at command in a common tumbler or a common teacup, into the bottom of which a handkerchief can be put so that it shall be an inch or two away from the nostrils or mouth, and which, when put over the mouth and nose, cannot be forced so close down upon the cheek upon either side that there will not always remain still considerable apertures at those points for the abundant admission of air with the chloroform vapor. This is nothing new, but I have had occasion so many times to suggest it to men of large experience and of age in the profession, whom I have seen attempting to administer chloroform in both wasteful and dangerous methods, that possibly it may not be out of place to notice this method in this connection.

Dr. BRUSH.—I came more to listen to-night than to say anything upon this subject, being here as a guest of the Society; but I have given quite a little thought and attention to this subject for a number of years, and more especially for the last two or three years. I have been impressed with the fact, or rather, it has been my judgment, that patients are ordinarily put under anæsthetics too rapidly. And I have also had my patience tried with the apparatus that has been used in the past, the uncleanly apparatus, where the anæsthetic comes in contact with the patient's face, and the choking that arises from getting the vapor too rapidly is distressing, and I began to make some experi-

ments some time ago in reference to bringing about some method by which the ether itself should be kept away from the face of the patient. And since coming here to-night I have been very much struck with the similarity of the apparatus which the chairman presents and the one which I have worked out and have used quite a little and latterly (through the courtesy of my friends, Drs. Pilcher and Fowler,) have used at the Methodist Episcopal Hospital of this city. I would say here, that while I have had a number of conversations with the chairman, and we have talked over to some extent this question, I have never before seen the apparatus which he presents here to-night, and he has never seen mine. And mine is very much the same. It is a modification of Allis's inhaler. The mouth-piece of the inhaler presented by the chairman is practically the same as mine; but I constructed mine so as to use nitrous oxide if necessary; so I have some stop-cocks for turning that on and shutting off the ether.

The first experiment I made was very similar to this. It had the modification of the Allis inhaler inserted in precisely the same way only smaller; and it seemed to me that the evaporating surface was not quite sufficient. I therefore had one constructed large enough to insert the Allis inhaler entire; and the one I now use is large enough to drop the inhaler into it entire without the rubber covering; the administration is practically the same as with the one the chairman has presented. Mine is a little more cumbersome than his, in order to have two stop-cocks to administer nitrous oxide. I have used it with great satisfaction; it is a cleanly way of administering an anæsthetic. The one presented here is more simple than mine, and if the evaporating surface is large enough it certainly would be better where it is desired to administer ether alone.

With reference to the administration of different anæsthetics I have made it a rule to study the pulse and respiration; if I find a weak heart, I don't want to use chloroform; if I find bronchitis, I should prefer to use chloroform rather than ether, provided the heart is strong enough to warrant its use. In many cases I find that nitrous oxide will answer the purpose required in the use of an anæsthetic, and ordinarily the patients come under it more rapidly and recover from it more rapidly, and in almost all the cases there is entire absence of nausea, while, in the main I think the anæsthesia is as complete as from ether or other anæsthetics.

Dr. FOWLER.—In the choice of anæsthetics, a subject which, as Dr. Pilcher says, should be studied most carefully and thoroughly, I think we have a theme for discussion of perhaps equal importance, if not greater, than the use of means for the accomplishment of the end, namely, the production of anæsthesia; and I had hoped that this dis-

cussion upon anæsthetics would tend rather in that direction than in the use of apparatus, although this latter is very important in its way, of course. But the danger signals, those points to be studied before the administration of the anæsthetic at all, the study of the patient's condition, the age, and all of those things which have a bearing upon the safety of the patient during the ordeal through which he is about to pass, are first to be considered. As Dr. Pilcher has remarked, the influence of ether upon old people, those in a degenerative age, so to speak, is usually bad, and the reasons for it are not always apparent. There may be no albumen in the urine, and there may not be a great deal of bronchial secretion as the result of the contact of the ether with the bronchial mucous membrane; and yet patients past a certain period of life behave badly, not only under the ether, but are quite apt to develop a form of nephritis subsequent to the operation. And, on the other hand, with thin ventricles and a weak first sound of the heart, together with the well known tendency to fatty degeneration of this organ, chloroform becomes a dangerous anæsthetic. And I believe there are cases in which it is impossible to bring patients under the influence of either ether or chloroform without approaching very closely to the danger line. For my own part I am far more solicitous as to what is going on at the other end of the line when I am operating, than I am as to what is transpiring under my eye. I can anticipate what may happen under my fingers, but I cannot anticipate what may happen with the patient, and especially an old patient to whom is being administered an anæsthetic and who is in the condition of complete anæsthesia. What special precautions should be taken before the patient becomes anæsthetized as well as after, and what length of time he should be kept under the anæsthetic, are all matters requiring careful judgment, and the person who administers the anæsthetic should be as thoroughly competent as any other person connected with the operation.

It has been the custom, almost routine practice, in some hospitals to administer atropine with a view to stimulating respiratory centres before administering the anæsthetic at all. It has also been the practice of some surgeons to give a hypodermic injection of morphia with a view of lessening the actual quantity of anæsthetic used. It has been claimed that a less amount of anæsthetic is necessary for the purposes of an operation when this course is pursued. I am not prepared to say that I fully endorse the hypodermical injection of morphia. I think it is poor economy to save the anæsthetic in that way, and have the increased risk of morphine narcotism in addition to etherization enter into the case. I must confess, however, that I have had a leaning towards the preliminary use of atropine, and I may say that I

believe it has been useful to me. It stimulates the respiration, and it is held by some surgeons of large experience—for instance, Thiersch, of Leipzig—that as long as the patient breathes deeply and snores loudly—in other words, if the patient respire vigorously—there need be no fear as to his condition. I am not inclined to disregard the pulse; but I will confess that so long as my patient makes some kind of noise, whether the groans indicating too little anæsthesia, or the deep breathing sounds of full yet safe anæsthesia, I give myself no uneasiness concerning him.

Another question relates to the comfort of the anæsthesia. There are some people who cannot bear the smell of ether, and who begin to resist the anæsthetic the moment the vapor of the ether comes in contact with their nostrils or their mouth. How common it is to see the patient begin to struggle almost as soon as the ether is placed over their face; how frequently it becomes necessary for all of the orderlies, all of the nurses, and all of the assistants, and finally for the operator himself, to interfere and assist in preventing the patient from throwing himself upon the floor and possibly escaping from the operating room. It is a sorry sight, and I think in a large number of cases it can be prevented. All this may be obviated by giving the patient nitrous oxide preliminary with either the apparatus of Dr. Brush, in which one can switch off easily from nitrous oxide to ether, or *vice versa*, or any ordinary nitrous oxide inhaler. Next to that I think the most efficient way of preventing the struggling is the use of chloroform preliminarily. A drachm of chloroform, judiciously used at the outset, in the administration of the anæsthetic, will almost always prevent all of the peculiar demonstrations which we have pictured.

As to the safety of the administration of chloroform under those circumstances, I take it that this small quantity is quite rapidly eliminated, and by the time the patient is fully under way with the anæsthetic scarcely any chloroform could be detected even in the tissues of the patient.

As to the use of nitrous oxide: I had hoped that Dr. Brush would speak more at length upon the special indications for the use of nitrous oxide, and the avoidance of that shock which the President has so aptly remarked may sometimes become as grave a feature of the operation as the operative procedure itself; and much of the shock following prolonged operations may be due to anæsthesia, as much as to the traumatism produced by the knife. My own experience with nitrous oxide is limited. I have not quite formulated the exact cases in which it would be most useful. Certainly it goes without saying that in short operations it is generally indicated as shown in the experience of dentists, who have used this agent for many years.

Whether for long operations it will be as useful as it has shown itself to be for short operations, I have reason to doubt. For operations in the perineum, or within the abdominal cavity, or where the patient must be thoroughly relaxed, I think nitrous oxide is not to be depended upon; why, we do not know exactly. One patient will be almost suffocated, or seemingly suffocated; their condition appears to be alarming; and although apparently thoroughly anesthetized, yet a peculiar rigidity of the limbs would prevent an operation, say that for hæmorrhoids, for instance. On the other hand I call to mind an occasion where Dr. Brush most successfully administered nitrous oxide for me in a case of laryngectomy. The nitrous oxide anesthesia was all that could be desired. The patient was under its influence during the removal of the larynx, a period of time covering one hour and forty minutes. I think in about three minutes from the time he removed the tube through which the anæsthetic was given the patient sat upon the table and looked around wonderingly, and, had she been allowed, would have walked to her room. It was a perfect revelation to me; I had never dreamed that it could be accomplished; and when I rather hesitatingly gave my consent that Dr. Brush should administer nitrous oxide, I confess it was with a great many misgivings, but the result was all that could be desired.

In the use of an anæsthetic inhaler, it seems to me that the first thing of importance, particularly in an ether inhaler, is the presence of a large surface from which the ether may be evaporated; not so much that it may be evaporated rapidly, but readily, and not allowed to choke up the meshes and spaces from which the ether would evaporate. In the next place, it should be cleanly; it should be so arranged as to be easily cleaned.

Another desideratum is that of simplicity. The more simple it is, the less liable it is to get out of order, the less liable to require repair. I take it to be a desirable feature, also, in an inhaler, with those who do surgical work in private practice, that it shall be portable. The Allis inhaler, in my experience, has been the very best for the purpose ever devised, as I think. The modification of the Allis inhaler, presented by our President, adds the advantage of the disuse of the air once inspired, or the rejection of it rather, loaded as it is with the elements of excretion from the mucous membrane of the respiratory organs. But does not the Allis inhaler in its original simplicity present some of the same advantages? This inhaler, as originally devised by Dr. Allis, possesses the advantage that the ether vapor and the air mixed pass easily in an unobstructed manner into the patient's respiratory organs. The objection to the old cone shape is that it is an exceedingly incomplete inhaler for the patient. In former times the

doctor would roll up a newspaper, wrap a napkin or a towel around, and immediately proceed to suffocate the patient with the same; and he very frequently would succeed. There is no question but that the suggestion of the Allis inhaler, which allows free ingress and egress of air, is a great improvement over the old and barbarous method, if the comfort of the patient who is to take the anæsthetic is to be studied at all. How much advantage there may be in the introduction of valves for the purpose of preventing the air being inspired over and over again, is a question. I think in the original Allis inhaler very little air is inspired a second time. With it, also, the patient makes vigorous efforts at expiration as well as inspiration.

The proper way to use the inhaler of Allis is to drop the ether on drop by drop; that doesn't mean to pour it on in a stream. The use of the dropper bottle is an essential feature of this form of inhaler, and should always be an accompaniment of it.

Another thing: The administration of an anæsthetic should always be commenced by placing the inhaler over the patient's face without a particle of ether in it, thereby gaining the confidence of the patient, and showing them how easily they can breathe through this apparatus without producing any discomfort. The point made by the President that ether should be given slowly, I believe to be well taken. With the Allis inhaler it is only necessary to begin dropping the ether upon the centre of the evaporating surface or bandage placed for that purpose, and to continue to drop in a limited quantity drop by drop. The surface or space upon which the ether is dropped may be enlarged gradually, until finally the administrator is passing the dropper bottle all over the surface; by the time this is accomplished the patient is fairly under the influence of the ether, and does not miss the disproportion between the atmospheric air and the ether which he is inhaling.

As to the question of portability, I have modified the Allis instrument to a slight degree, making it a more portable inhaler. I have also added a little suggestion of a chloroform inhaler in conjunction with this inhaler. It may be carried in the breast pocket of the coat. A little rod at the top serves the purpose of fixing it in position. I do not use the rubber hood with this; I simply roll a towel to about eight inches in width and the full length of the towel, and then roll my inhaler in this. In this way I have a clean towel for every patient. To make this a chloroform inhaler, I simply put a little bit of absorbent cotton in the middle of the inhaler between the meshes of the bandage, and my anæsthetizer drops his chloroform only upon the cotton. All the rest of the inhaler being left free for the passage of air, and the chloroform dropped on that limited space, the supply used must be

limited, and safety is assured. To administer it from the whole evaporating surface would be most dangerous.

The recent improvement in the Allis inhaler, which consists of having the bars with which the bandage is threaded made in a separate piece, and with the upper edge of the bars exposed in such a way as to pass the bandage back and forth without the trouble of threading them, is a most excellent device. I do not claim any particular advantage for this inhaler of mine over that of Dr. Allis, nor can I say that it is better than the one presented this evening; but I do say that in the Allis inhaler there is less inhalation of air already inspired than any other inhaler I know. As to the economy of ether, it was claimed by Dr. Allis that he can anæsthetize a patient, if necessary, in a much shorter space of time and with the use of a less quantity of ether than by any other method known at the time of the introduction of his instrument. He referred, of course, to the close cone then almost exclusively used. How well founded that claim may continue to be, I cannot say.

Dr. RAND.—There is one point to which Dr. Fowler has referred incidentally, which will bear emphasizing. It is too often the custom in hospitals to trust the administration of anæsthetics to the youngest and most inexperienced interne; whereas the position of administrator of the anæsthetic is often more important, so far as the patient is concerned, than the position of the operator himself. I am confident that injury to the patient is often a result of this custom. Instead of maintaining complete anæsthesia with the least possible amount of the anæsthetic, we often see such anæsthetizers give it to the point of producing alarming and dangerous symptoms that might have easily been avoided. And it seems to me that a desirable thing to be attained is that experienced anæsthetizers be connected with all our large institutions, and that such important work be entrusted to them entirely.

I have always been satisfied with the Allis inhaler. But it seems to me that this one of Dr. Wight's presents two advantages not yet mentioned; it covers less of the patient's face than the Allis, and thus better allows the anæsthetizer to watch the patient's color; and it also prevents the patient blowing out so much of the ether during expiration. It is therefore safer when gaslight is being used, and less unpleasant to those in attendance. I have seen it used quite a number of times, and have been pleased with the result.

I have brought with me a little apparatus which I have found exceedingly useful in the administration of chloroform where it is desirable to keep the field of operation clear. I have found it especially useful in operations around the mouth, as in hare-lip or cleft palate. It is perhaps hardly necessary to say anything of its construction. The

idea is not original, but whose it is I have forgotten. The tube is passed down the nostril and the air forced through the chloroform expels its vapor in such quantities as are desirable.

The choice of an anæsthetic, I think, in a general way, has already been stated. Chloroform has always seemed to me to be preferable where the kidneys or respiratory apparatus are involved; ether where the heart is diseased, and for general work. I have always thought well of starting patients with chloroform. I think they are far less apt to cough and become violent when a little chloroform is administered prior to the administration of ether; but I avoid the chloroform when the heart is at all affected.

Dr. WACKERHAGEN.—I have nothing new to offer on this subject. I have never seen Prof. Wight's inhaler in use, but have used many of the new ether inhalers in the market, and have returned to the use of the towel, newspaper, cone, or cylinder. For the administration of chloroform I use an ordinary tumbler with a handkerchief stuffed into it.

I have never administered ether to young children, always chloroform.

Dr. BRUSH.—When I came down here I had no thought of saying anything on the subject that is before us; but Dr. Fowler has referred to my not having made remarks as extensively as he hoped for on the subject of nitrous oxide anæsthesia. I have had quite a little experience for the last ten years with this anæsthetic, and I have come to the conclusion that it is like all the other anæsthetics—you can't always depend on it. You will once in a while come across a case where you cannot use it; and therefore I have come to this habit: In going to any case to anæsthetize with nitrous oxide, I generally take the three anæsthetics with me; and if I find that the patient does not come under the nitrous oxide readily for the prolonged effect, if it meets with the judgment of the operating surgeon I give the ether or chloroform, as may seem best. But ordinarily, or in the majority of cases, if it is desired to give it for prolonged operations, it can be done. I gave it in one operation for stone, and the operation was forty minutes. The patient was thoroughly anæsthetized, and was practically recovered from it before he could be gotten into bed.

There was no shock; and that is one fact to be noticed, you do avoid the shock that you get from ether or chloroform in the use of nitrous oxide gas.

I have also given it for amputations and many of the most important operations, with great satisfaction to both operator and patient. These operations have varied as to time from fifteen minutes to over an hour and a half; but as I have said, there will be occasionally a

patient that will manifest some unpleasant symptoms for the operator, such as rigidity or unsteadiness, and occasionally (though this is rare) a case where anæsthesia is not complete. Where I meet such cases, with the combination inhaler which I now use an immediate change to ether or chloroform can be made; but experience leads me to this opinion, that where nitrous oxide can be used in surgery it is safer and pleasanter for the patient, economizes the time of the operator, and anæsthesia can be maintained almost indefinitely with proper care on the part of the administrator, the patient being in a better condition when the operation is over than if either ether or chloroform had been used.

I have lately been experimenting somewhat upon animals with nitrous oxide and chloroform combined; and, while I have not come to any definite conclusions as yet, the indications point to the possibility that the combination of the two will make a very safe anæsthetic. It seems to act as a stimulus, and overcomes the depression attending chloroform anæsthesia where chloroform is used alone. As Dr. Fowler has said, nitrous oxide may be used for preliminary anæsthesia with advantage. Dr. Clover, of England, has used it in this way with good results, I believe, and I have also; but so far it has been comparatively little used for prolonged anæsthesia, being limited to the operations of the dentist mainly. That it has a wider field than this in the future I believe. It can be used with safety were chloroform and ether would be rejected; but that it will supplant these anæsthetics is not to be expected. It will simply take its place as one of the agents that rightly used may enable us to conserve the vital forces of those upon whom we are called to operate for the cure of disease.

Dr. WIGHT.—I well remember many years ago of a machinist, weighing about one hundred and twenty-five pounds, who had got a piece of steel in his finger that needed to be cut out. That was in the palmy days of chloroform; that was before I had thought seriously upon the subject of ether. I began to give him chloroform, and just as soon as he began to get the effect of it, it made him a wild beast, and I finally had two or three of my confreres come in and help quiet him. No sooner did he begin to get the chloroform again than he cleaned us all out. Finally he got angry, and said he: "Confound it, cut this thing out anyhow."

But a matter of more practical moment. For many years I have been in the habit (and I believe that the administration of chloroform was carefully and successfully done at times) of stopping and waiting and resuscitating my patient. Many a time have I done that; and right here let me say that the best method I found for doing that was to lower the head as far as possible and raise the feet up, and raise

the table as far as possible, and put something under it to steady it. Occasionally I have had to do the same thing with ether, but very infrequently, and I felt very much safer with the use of ether than chloroform. Now another thing which developed to my mind is this: A great majority of patients went easily under ether, but occasionally I had a patient that wouldn't, and for such patients I had chloroform at hand and gave that. Another thing: In years gone by I have been in the way to operate on the same patient twice within a few weeks. At one time a patient would take ether in the most desirable manner, and there would be not the least difficulty; and then perhaps the next time I would have to postpone the operation a few days later. Or perhaps for three or four time a patient would take ether all right and then another time they would not take it. And it is so with chloroform. It is so with any anæsthetic I know of, yet I can't tell you why it is so. I can't tell you beforehand what a patient is going to do until he does it; nor can I tell you what anæsthetic it is best to use beforehand.

I would like to add a word more. With my experience of more than forty cases I have not had any difficulty in using this apparatus. I have had the lethal conditions afterwards, but patients have come out right away. Whereas with the use of cones and other apparatus in which there is a reinhalation of the expired air, there is to my mind far more danger. They remind me of the sailors down in the boats in the harbor that had been poisoned with carbon di-oxide from coal; I watched them for hours before they came out of it. And it is the same way with ether with the cones, I have noticed it over and over again, and it may be the same way with this apparatus, but I don't think so; it has not been as yet.

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EDITORIAL.

MAGISTRAL PRESCRIPTIONS.

In a late number of a medical journal (*Times and Register*, Phil., Oct. 5, 1889) is published a prescription for bronchial asthma, evidently translated from the French, and credited to Dr. Poulet, wherein a half dram of oxalic acid is made to do duty in an eight-ounce mixture, of which a tablespoonful is to be taken every hour until relief is obtained, thus giving two grains at a dose of a chemical which the dispensatories agree is not used in medicine, and which is frequently used in domestic parlors for cleansing brass kettles and occasionally by bankrupts and disappointed lovers as a means of shuffling off this mortal coil. As it reads, the prescription is either a mistranslation or an oversight in proof-reading, unless, perchance, the French asthma is particularly obstinate, demanding heroic treatment. The conservative American practitioner will look considerably before applying it to the native-born citizens of this young and tender country.

While the use of such a formula would be hazardous, the use of many, if not most, of the formal prescriptions published so commonly in current medical literature is very disappointing. It is the common lot of all who follow the custom of trying the published prescriptions—whether they are under the suggestion of unrecognized observers or have the authority of a great name—to meet with pretty uniform failure in obtaining the results claimed for them by the writers. This state-

ment does not impeach the honesty or the truthfulness of the writer, for however constant the habit of medical men of rushing into print with new experiences, no reader ever accuses the writer of wilful misstatement. The certainty is, however, that much of the recommendation of drugs and of formulas is made on the basis of moderate experience in their use. Very few of the remedies offered to the medical public by chemical analysts and by manufacturing firms survive a brief trial, and this experience is so uniform that cautious men who have years of observation behind them are chary of taking much risk with new therapeutic products.

But granting the honesty of the writer in his support of a special prescription, the personal equation of the observer must account largely for the failure of the readers to attain his results. He has dealt with certain conditions, which are not duplicated in the experience of others, and the results are not the same. Formularies and text-books contain many prescriptions which have become classical, and publishers have not been slow to adopt the catch-penny ruse of circulating the "favorite prescriptions of eminent practitioners." As a rule, following these prescriptions is an unreliable guide in practice. They should be carefully scrutinized to avoid explosive or poisonous or incompatible compounds from bad proof-reading, but, also, the patient should be saved useless expense at the pharmacy, which must always ensue unless there is conscience and intelligence and good judgment in the leadpencil of the prescriber. A Southern doctor, a few years since, saw in one of the journals that a mixture of equal parts of hydrate of chloral and camphor was excellent as an anti-pruritic. He tried it on a raw surface on his own person, and published in the same journal that his life was thenceforward to be devoted to finding the man, who suggested this mixture for that purpose, that he might shoot him on sight. The doctor might himself have found an earlier grave than he desired had one of his patients received the promised nepenthe at his hands. Prescriptions are to be respected, but they usually require great longevity before they are to be venerated.

PROCEEDINGS OF SOCIETIES.

BROOKLYN MEDICAL MICROSCOPICAL SOCIETY.

The twenty-fifth regular meeting of this society was held September 4, 1889, at the Hoagland Laboratory, the president, Dr. C. Heitzmann occupying the chair. After the transaction of the regular business, papers were read by Dr. Heitzmann on "The Intimate Structure of the Derma of the skin," and by Dr. J. H. Mennen on "Silver Images in Inflamed Cornea."

Dr. Heitzmann said that, in reviewing the literature of this topic, the essayist comes to the conclusion that a thorough knowledge of the structure of the derma is as yet lacking. This tissue becomes intelligible only through the knowledge of tendon, in which the bundles run a strictly parallel course, whereas in the derma, as in aponeuroses, the bundles are interlacing. Transverse sections of the bundles show interstices filled with medullary and delicate fibrous connective tissue; they are rich in blood-vessels and nerves, and may be termed interstices of the first order. Smaller groups of bundles are separated from one another by groups of the second order, likewise holding smaller blood-vessels. Between the larger bundles we find protoplasmic formations, all interconnected, and thus producing a network, strikingly similar to that of a myxomatous connective tissue. These are the interstices of the third order. The bundles themselves are split up, though incompletely, into smaller ones by interstices of the fourth order, holding thin layers of nucleated protoplasm, or elastic fibres. The reticulum of protoplasm is continuous throughout the derma. In longitudinal sections of bundles only the protoplasmic bodies, but no lateral offshoots and no net-like arrangement thereof, can be seen. Dr. H. then described the papillary layer of the derma, which shows differences in structure according to age. In the new-born the papillæ are mainly protoplasmic in nature; made up of delicate fibres in the middle aged; and in old age of a coarse fibrous tissue, freely intermixed with hydropic protoplasmic bodies, thus causing the appearance of a myxo-fibrous structure. All the bundles are traversed by an extremely delicate reticulum of living matter, that can be brought to view by treatment with alcohol, or by treatment with solutions of gold chloride. The same reticulum is visible in specimens hardened in solutions of chromic acid, immediately after mounting in glycerine. As soon as

the glycerine soaks into the tissue the reticulum disappears. These details can only be studied in specimens mounted in glycerine, not in Canada balsam.

By order of the president,

RICHMOND LENNOX, *Sec'y.*

BROOKLYN MEDICAL MICROSCOPICAL SOCIETY.

The twenty-sixth regular meeting was held at the Hoagland Laboratory, on October 2, 1889, with the president, Dr. C. Heitzmann, occupying the chair. Dr. G. T. Kemp was unanimously elected to active membership, and Dr. A. R. Robertson was proposed. A publication committee was appointed to decide on the suitability of papers for publication, consisting of the president, *ex officio*, the secretary, and of Dr. Van Cott.

After the transaction of the regular business, an address was given by the president on the "History of the Development of Enamel," which was discussed by Drs. Eccles, Van Cott, and Heitzmann.

By order of the committee,

RICHMOND LENNOX, *Sec'y.*

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

A regular meeting of the Medical Society of the County of Kings was held at the rooms of the society, No. 356 Bridge Street, September 18, 1889, at 8 o'clock. The president, Dr. Matheson in the chair; W. M. Hutchinson, secretary.

There were about sixty members present. The minutes of the previous meeting were read and approved.

The Council reported for election to membership the names of the following: Drs. Madeline Marquette, Wm. S. Applegate, and L. A. W. Alleman.

The president declared the following duly elected to membership: Drs. John R. Kevin, Adam Schauf, and Robert Swan.

The following were proposed for membership: Drs. Lewis P. Grover, 270 South 5th Street, University of the City of New York, 1889, proposed by N. L. North, M.D., endorsed by Walter B. Chase, M.D.; Clarence Thwing, M. Sc., 156 St. Mark's Avenue, Univ. Med. Coll., N. Y., 1887, proposed by Edward P. Thwing, M.D., endorsed by Geo. W. Brush, M.D.; Frank P. Keyes, 77 Hanson Place, L. I. Coll. Hospital, 1888, proposed by S. E. Fuller, M.D., endorsed by

D. F. Lucas, M.D.; Lemuel Grant Baldwin, 207 Clinton Street, L. I. Coll. Hospital, 1886, proposed by H. Arrowsmith, M.D., endorsed by A. Ross Matheson, M.D.; Frank W. Fleischhauer, M.D., 158 Bergen Street, L. I. College Hospital, 1889, proposed by Ernest Palmer, M.D., endorsed by A. Ross Matheson, M.D.

The scientific programme consisted of the report of the Committee on Practice, made up of the following papers upon typhoid fever: "Etiology and Prophylaxis," by D. F. Lucas, M.D.; "Diagnosis," by Stephen E. Fuller, M.D.; "Treatment," by John A. McCorkle, M.D.; "Complications and Sequelæ," by Wm. Maddren, M.D. These papers were discussed by Drs. Johnson, Eccles and Blake.

There being no further business, on motion the meeting adjourned.

W. M. HUTCHINSON, *Sec'y.*

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

Subjects for November Meeting (Nov. 19th): "The Pathological Processes of the Nervous System," by Landon Carter Gray, M.D.; "The Therapeutic Use of Oxygen in Pneumonia," by J. M. Winfield, M.D.; "A Criticism of the Weigert Hot-air Treatment in Pulmonary Tuberculosis," by Wales L. Cary, M.D.

THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

The next annual meeting will be held in Albany, February 4 to 6, 1890.

The Business Committee has been appointed, as follows: Dr. Geo. H. Fox, 18 East 31st Street, New York; Dr. Henry Flood, Elmira; Dr. Herman Bendell, Albany.

Applications should be made *before January 1st*, by those desiring to secure the proper arrangement of time and subjects.

Papers should not exceed fifteen minutes, and the title should accompany the application, which may be made to any member of the committee.

DANIEL LEWIS, *President.*

62 Park Avenue, New York, Oct. 10, 1889.

BROOKLYN SURGICAL SOCIETY.

At the annual meeting of this Society, held September 19th, the following officers were elected for the ensuing year: L. S. Pilcher, M.D., president; J. S. Wight, M.D., member of council; H. W. Rand, M.D., secretary.

MISCELLANEOUS.

BROOKLYN VITAL STATISTICS FOR SEPTEMBER, 1889.

By J. S. YOUNG, M.D., Dep. Commissioner of Health.

Population, estimated July 1, 1889, 834,607	The number of Births reported was	1207
In the month of Sept., there were 1391 Deaths, the rate of mortality being 20.28 per 1000 of population.	The number of marriages reported was.....	493
	The number of Still-births reported was.....	118

The mortality by classes and by certain of the more important diseases was as follows:

Causes :

1. Zymotic.....	323	Malarial Diseases.....	19
2. Constitutional.....	319	Diarrhoeal Diseases (all ages).....	149
3. Local.....	584	“ “ (under 5 years).....	127
4. Developmental.....	119	Phthisis.....	157
5. Violence.....	46	Bronchitis.....	51
Measles.....	1	Pneumonia.....	73
Croup.....	25	All Respiratory.....	149
Diphtheria.....	79	Bright's Diseases.....	36
Scarlet Fever.....	5	Puerperal Diseases.....	6
Typhoid Fever.....	28	Old Age.....	36
Whooping Cough.....	11	Suicide.....	8

Reported Cases :

Diphtheria.....	154	Measles.....	13
Scarlet Fever.....	46	Typhoid Fever.....	47

Deaths by sex, color, and social condition, were as follows.

Male.....	754	U. S. Native.....	985
Female.....	637	Foreign.....	403
White.....	1366	Married.....	370
Colored.....	25	Single.....	872
Widows, Widowers, and not stated..		149	

Still-births, excluded from list of deaths, were as follows:

Males.....	60	} Total.....	118
Females.....	58		
Deaths in public institutions.....	101	Homicides.....	1
Deaths in tenement houses.....	692	Suicides.....	8
Inquest cases.....			102

Age Periods:

Deaths under 1 year.....	538	Total deaths, 5 to 20.....	104
“ “ 5 years.....	214	“ “ 20 to 40.....	238
Total deaths under 5.....	652	“ “ 40 to 60.....	210
		“ “ 60 and upwards.....	187

Certain foreign and American cities show the following death-rate for the month of September:

Brooklyn.....	22.28	Vienna.....	19.52
New York.....	22.84	Paris.....	20.64
Philadelphia.....	18.62	London.....	14.70
Berlin.....	20.22	Glasgow.....	20.30
Dublin.....			23.70

THE MNEMONICS OF ELECTRICAL TERMS.

BY W. E. FOREST, M.D.

Since electricity has assumed considerable importance in medicine, and as the general practitioner, burdened as he is with so many things, may find some difficulty at times in recalling to mind the definition of electrical terms, it may not be out of place to give to your readers an illustration that I have found useful in fixing the meaning of these terms. To the non-medical mind the formula might seem vulgar, but in science there is nothing unclean. The term *volt* is a common one in electricity. It means the unit of measure of electric force or power, or, we might say, pressure. Thus we say a battery giving so many volts is necessary to run an electric light or kill a dog.

We may represent the voltage by the contractile power of a male bladder.

The term *ohm* is the unit of measure of resistance to the passage of an electric current. The ohm or ohmage may be represented, then, by the calibre of the urethra attached to this bladder; or, a still better illustration to the medical mind, a stricture in that urethra (a not uncommon condition of the male urethra).

The term *ampere*, or milliampere (the latter meaning the thousandth of an ampere), is the unit of measure of the amount of electric current passing through an object in a second of time. It is a resultant of the pressure and resistance, the volts and ohms, and may be represented by the volume of urine passing the stricture. Thus the more powerful the bladder (more volts) and the less the stricture (fewer ohms) the greater the current (more amperes). This equation can be varied indefinitely. This illustration explains why the same number of cells will not give the same number of amperes or milliamperes when passed through different persons or different parts of the body; the resistance is different.

The following, then, would be the graphic formula for this subject:

Volts or Voltage	= bladder.
Ohms	= stricture.
Amperes	= passing current.

There is no patent on this formula, and Professor Loiset is at liberty to use it in his method for strengthening the memory.—*N. P. Med. Record.*

THE NEW TITLE.

THE WHY.

Germes in the air,
 Germes in the sea,
 Germes wherever one may be,
 Germes and to spare
 Growing in me,
 German germes from Germany.

Whate'er we say
 Or write or think,
 Germes will wriggle in the ink.
 On tongues they'll play,
 And "culture" drink
 From each minute cerèbral chink.

— *Boston Med. and Surg. Journal.*

NERVE PHYSIOLOGY PRIZE.

WITH the wish to promote research in certain departments of physiology, and to aid in defraying its cost, a member of the American Physiological Society has offered two hundred dollars for the best research or researches bearing on one or more of the subjects stated below, viz :

"The rate of transmission of nerve impulses, afferent and efferent, and the duration of reflex and reaction time in the higher animals, especially man ; also the conditions, normal and pathological, which alter such rates and times."

The competition is limited to residents of North America, and the prize will be awarded for original work done after January 1, 1889. The award will be made by those persons who, on October 1, 1890, constitute the Council of the American Physiological Society. In making its award, the Council will take into consideration researches of which printed or legibly written accounts, marked on the outside "Nerve Physiology Prize," have been received by the then Secretary of the Society before October 1, 1890.

To obtain a prize, a research must have a direct bearing on human physiology, and good researches on man will be preferred to similar researches on other animals ; but experiments on mammals other than man, if applied to the interpretation of the phenomena of the human body and supplemented by observations on man, will have weight.

Previous publication will not debar a research from competition, provided the work has been done after January 1, 1889.

The Council reserves the following rights : to withhold the prize if, in its opinion, no research presented is sufficiently worthy ; to award only a part of the prize if, in its belief, a research, though meritorious, does not deserve the whole ; to divide the prize between two or more candidates in ratios which seem to it just ; and if it think it desirable, to require the competitor to demonstrate his experiments to a committee appointed by the Council.

For the present, communications concerning the prize should be addressed to H. Newell Martin, Secretary, Johns Hopkins University, Baltimore, Md.

ANÆSTHESIA.

Dr. Geo. T. Shrady, after a study of the subject of anæsthesia, has arrived at the following conclusions :

1. In commencing the administration of ether the gradual method is to be preferred.
2. Its employment allows the lungs to empty themselves of residual air, prevents coughing and struggling, and places the organs in the best possible condition to receive and rapidly utilize the ether vapor.
3. After the stage of primary anæsthesia is reached, the more pure ether vapor the patient breathes the better.
4. The shorter the time of anæsthesia, and the smaller the amount of ether used, the less likely are the unpleasant sequelæ to occur.
5. The more evenly it is administered the less shock to the patient.
6. Anæsthesia should be entrusted to experienced administrators only.
7. Many of the fashionable efforts to resuscitate patients are not only useless but harmful.
8. The minimum amount of force should be employed to restrain the muscular movements of the patient.
9. Mixed narcosis is often advisable for prolonged operations.
10. The utility of the galvanic battery, in threatened death, is yet to be proven.
11. The most trustworthy means of resuscitating desperate cases are artificial respiration, hypodermic stimulation, inhalation of nitrite of amyl, and inversion of the body.

TREATMENT OF WHOOPING-COUGH.

Dr. Genser (*La Clinique*), at a recent meeting of the Medical Society of Vienna, reported that he had treated some two hundred cases of whooping-cough, according to two methods. On some he practised Michael's method of insufflations of medicated powders into the nasal passages, while to others he administered antipyrin by the mouth.

Michael's method was tried in seventy-six cases; by means of a bent glass tube powdered benzoic acid was insufflated into the nasal passages. The results obtained were only fair; the duration of the treatment was forty-three days; and its only real advantage was that it put a stop to the vomiting. On the whole, it was not well borne by the little patients, whom it threw in a state of excitement and frequently produced severe attacks of coughing.

Antipyrin not only reduced the number of coughing fits, but also their severity and duration. In the majority of cases the duration of the treatment did not exceed twenty-four days. The average daily dose was one and a half grains for each year, so that a five-year-old child took, during forty-eight hours, fifteen grains of antipyrin in two and a half ounces of water flavored with some syrup. In five cases, complicated with pulmonary lesions, antipyrin gave negative results.

These facts seem to establish the favorable action of antipyrin in whooping-cough. The author asks whether antipyrin acts as an antiparasitic, or as a sedative, diminishing reflex excitability? He favors this last supposition, and concludes that although antipyrin is not a specific for whooping-cough, it renders valuable services in its treatment, being at the same time perfectly harmless in its action.

The author likewise tried antifebrin, but with results far less satisfactory.—*L'Abeille Medicale*, Jan. 28, 1889.—*Medical News*.

NEW YORK MEDICAL CHARITIES.

Nellie Bly, a reporter of the *N. Y. World*, has been investigating the medical charities of New York, and has come to the following conclusions:

First. That New York is the most charitable city in the world.

Second. That charity is daily outraged in numerous cases.

Third. That the poor have a much better chance to improve their conditions than those in moderate circumstances.

Fourth. That too much and ill-directed charity breeds pauperism.

CONTRAINDICATIONS FOR THE USE OF ANTIPYRIN DURING THE MENSTRUAL PERIOD.

Cases of toxic accidents from the use of antipyrin have been frequently reported, says the *Therapeutic Gazette* (March, 1889), but the conditions under which these results are produced have not been sufficiently studied. Without doubt in some cases the poisonous effect is to be attributed to the poor quality of the drug, but the condition of the patient also deserves consideration. In the *Revue Générale de Clinique et de Thérapeutique* for January 24, 1889, it adds, Dr. W. Huchard states that a year ago he administered fifteen grains of antipyrin to a woman suffering from violent dysmenorrhœa. As the result of the administration of this drug, the menstrual flow was suddenly arrested. The patient was seized with violent chill, chattering of the teeth, face became cyanosed, and there were frequent attacks of syncope; the pulse was small and weak, and the patient complained of great headache. The condition was such as to cause great anxiety for nearly an hour, when the effects gradually passed off. Dr. Huchard thinks that he has in two other cases observed similar symptoms, although less marked, and he now regards the presence of the catamenial flow as a positive contraindication to the use of antipyrin.—*Boston Med. and Surg. Journal*.

THE INSANE OF KINGS COUNTY.

The recent report of New York State Board of Charities to the Legislature states that the number of insane in the asylums of Kings County October 1, 1888, was 1,681, as against 1,532 October 1, 1887, of whom 681 were men and 1,000 women, an increase during the year of 149. Of this number 260 were in the temporary buildings on the St. Johnland County farm on Long Island, and the balance in the asylum at Flatbush. This is still greatly crowded, the removals to the Long Island farm, since its purchase, having been less than the increase in the insane of the county during this period. The cottages in course of erection last year are now completed and furnished, but considerable delay has been caused in occupying them, because of failure to provide suitable arrangements for properly warming them. A removal of 35 patients was made the last week in November, and it is said that from 30 to 35 will be removed weekly, until the cottages are fully occupied, which, with the temporary buildings now in use, will accommodate about 600 patients, equally divided as to sex. This

will still leave over 1,000 insane at the Flatbush asylum, which number is greatly in excess of its proper accommodations, and more or less crowding of the institution will, therefore, continue to exist. This can be relieved only by the erection of additional buildings on the Long Island farm, which has an area of nearly 1,000 acres of arable land, well adapted to its purposes.

Attention is invited to the report of the standing committee of the Board on the insane, in regard to the crowded condition of this institution, and the necessity of further accommodations for the insane of the County, and the importance of sending its acute classes to the State hospitals.

MEDICAL CURIOSITIES.

The Virginia Board of Medical Examiners received the following answers to questions put to graduates of medical colleges, who, under the Virginia Law, applied for licences to practice medicine in that State.

Describe the larynx. *Ans.* The larynx is composed of cartilage. The œsophagus passes through the larynx.

What is the function of the liver? *Ans.* Do not know.

Give tests for arsenic. *Ans.* Sulphuretted hydrogen is one. Don't know rest.

Give test for mercury. *Ans.* Do not remember.

Give dose of tartar emetic. *Ans.* Ten grains.

Give dose of sulphate of atropia. *Ans.* Hypodermically, 10 grains; by mouth, 60 grains.

Give dose of corrosive sublimate. *Ans.* One grain.

How would you treat placenta prævea? *Ans.* I don't what it is.

Give dose of powdered cantharides. *Ans.* Forty grains.

What is the source of iodine? *Ans.* It is dug out of the earth in blocks like iron.

Describe dengue or break-bone fever. *Ans.* By four applicants: A fever that comes on soon after the bones are broken. By one applicant: The patient should be cautioned against moving, for fear the bones should break.

Describe the peritonæum. *Ans.* It is a serious membrane lining the belly, and extending into the chest, covering the heart and lungs.

USES OF BORACIC ACID.

Dr. Lebovicz, in the *Weiner med. Presse*, narrates some uses to which he has put boracic acid.

1. Boracic acts antiseptically. Every soldier should carry one ounce of it in his overcoat pocket, and a handkerchief cut into two triangles for necessary bandages. Simply sprinkling a wound with finely powdered boracic acid suffices to insure rapid healing. This remedy being odorless and itself absorbing all odors, the author has used it advantageously in abscesses, ulcers of the feet, caries and necrosis of the bones, and in complicated fractures.

2. In anthrax and after the incision of furuncles it acts well when applied directly to the parts. Forming furuncles should be painted several times daily with the following :

℞.—Boracic acid, }
Water, } - - aa equal parts.

3. In burns, when the flesh is exposed, it is necessary to be careful with poisonous antiseptics. Boracic acid possesses the advantage of being non-poisonous. He covers the the burnt surfaces with a boracic vaseline ointment in the proportion of one to five :

℞.—Boracic acid (finely powdered) 20 parts.
Glycerine, - - - - 15 “

Mix, and add,

Vaseline, - - - - 85 “ —M.

Apply twice daily.

In severe burns with fever, the author combated the fever by the internal administration of the following :

℞.—Boracic acid, - - - - 4 parts.
Glycerine, - - - - 10 “
Water, - - - - 100 “
Syrup of poppies, - - - - 25 “ —M.

Sig.—A teaspoonful every two hours.

A NOBLE FEE.

Sergeant-Major Freyer, M.D., I.M.S., has received a fee of one lac of rupees (10,000 sterling) from H. H. the Nawab of Rampur, as a token of esteem as well as an acknowledgment of his valuable services in the successful treatment of himself and General Azimuddin, the popular head of the Administrative Agency of the State, who had suffered for nearly three months from a malignant rheumatic fever; his recovery has been the occasion of great rejoicing at Rampur. This is said to be the largest fee ever received by a medical practitioner in India, and probably has never been exceeded in any country.—*British Medical Journal*, October 6, 1888.

AMERICAN ACADEMY OF MEDICINE.

The American Academy of Medicine is endeavoring to make as complete a list as possible of the Alumni of Literary Colleges, in the United States and Canada, who have received the degree of M. D. All recipients of both degrees, literary and medical, are requested to forward their names, at once, to Dr. R.J. Dunglison, Secretary, 814 N. 16th Street, Philadelphia, Pa.

KINGS COUNTY PHARMACUETICAL SOCIETY.

The regular meeting of this society was held October 8th, President Davis presiding. Messrs. William Mueller, O. S. Meyer and R. C. Werner were elected members. Mr. DeForest read a paper upon Boro-Citrate of Magnesia.

The scheme for starting a College of Pharmacy in Brooklyn, was discussed, and definite action was deferred for one week. At a special meeting held on the 15th, the society took the matter up, and after considerable discussion, it was indefinitely postponed, some of its ardent supporters suddenly changing front, the reasons given being lack of pecuniary support. It is now known that a good nucleus was ready to be subscribed had favorable action been taken (several thousand dollars). The society recommended the continuance of the Lecture Course for 1889-90.

F. N. BLISS,
Secretary.

BROOKLYN MEDICAL JOURNAL

PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE COUNTY OF KINGS.

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VOL. III. No. 12. }
WHOLE No. 24. }

BROOKLYN, N. Y., DECEMBER, 1889.

{ Single copies 25 cents.
{ \$2 a year, in advance.

ORIGINAL ARTICLES.

ETIOLOGY AND PROPHYLAXIS OF TYPHOID FEVER.

BY D. F. LUCAS, M. D.

Read before the Medical Society of the County of Kings, Sept. 18, 1889.

Typhoid fever is a fever of long duration, usually attended with diarrhœa, enlargement of the spleen, and characterized by an inflammatory affection of the agminated and solitary glands of the intestines, gastro-intestinal disturbance, and a peculiar rash. The questions as to the origin of the poison and the manner in which it is propagated are of extreme interest and importance. As to the nature of the poison we can say but little, except as we see its effects on the patient suffering with the disease. Klebs and others have claimed to have identified specific typhoid bacillus, which has been found in the tissues, blood, and lymphatics.

Two views are entertained regarding the origin of the poison : one, that it is specific in its nature, and derived only from some pre-existing case of the disease ; the other, that it may be generated anew by the decomposition of sewage, and perhaps of other forms of animal filth. Broadbent says that there is overwhelming evidence that, as a rule, the poison is derived from some previous case, and the only facts which seem to require the supposition of its independent origin are occasional outbreaks of fever in villages or isolated buildings which

cannot be traced to any known source. On similar grounds, however, we should have to admit the origin *de novo* of small-pox and all other contagious affections. With increased experience in investigations of this kind, unexplained outbreaks become more and more rare.

There are, again, many instances known in which water largely contaminated by sewage has been consumed for years without giving rise to fever, until the sewage has itself become contaminated by typhoid excreta, when an epidemic has at once broken out.

So with regard to milk. Impure water has been habitually employed in its adulteration without traceable bad effect; but when to this water typhoid poison has gained access, the disease has immediately begun to be distributed with the milk. I believe that typhoid is always propagated, and its poison generated from a pre-existing case. It is rarely, if ever, transmitted from person to person. Nurses, medical men, and clergymen and other persons visiting those who are suffering with the disease are rarely attacked when proper precautions are observed. In cases of gross neglect and uncleanness, attendants will contract the disease.

I do not believe that the disease is ever contracted by the inhalation of sewer-gases into the lungs at any time, but if this same sewer-gas be contaminated by the excrement of a typhoid patient and is absorbed by drinking-water, milk, or other food substance, and conveyed to the alimentary canal of an individual in a suitable condition of health, that typhoid fever will follow.

The most common vehicle of the poison is drinking-water, which may be contaminated in various ways, chiefly through sewage. The water-supply of a town may be thus poisoned at its source, such as a river into which drains empty themselves, or a reservoir or well accidentally contaminated. In some places the subsoil-water, permeating a bed of gravel, is at the same time the well-water of a village and reservoir of its sewage.

An imported case of fever will, under these circumstances, poison almost the entire community. With these examples of wholesale dissemination of typhoid fever must be mentioned the so-called milk epidemic already alluded to. A case of fever occurs at a farm or among the employes of a dairy; from defective sanitary arrangements the water used at the farm or dairy becomes contaminated by the excreta; this is added to the milk as an adulteration, or, as is usually said, is used in washing out the cans: and in this way the poison obtains access to the milk, where apparently it must increase very rapidly.

There is no question as to the harmfulness of sewage in water used for drinking purposes. Whether the water be taken from wells or

from rivers or from lakes, whether it be the water supplied an isolated dwelling or a populous city, it does not seem to produce typhoid unless the sewage is contaminated with the excreta of a typhoid patient. So far as I know, there is no way of determining the presence of the poison in the water. Chemical methods are inadequate to the detection of sewage unless the sewage is present in large quantities or the water is unusually free from other organic matters. The inability of chemical methods is of no practical importance, as the presence of sewage in the water can be determined, and, for protective purposes, the knowledge that sewage enters the water is all that seems to be required, because where there is sewage there is danger of typhoid infection.

There is no doubt that the endemicity of typhoid fever in our cities is in great part due to the sewage in the water-supply. Many of our public water-supplies contain sewage, and its harmfulness in a general way is unquestioned. Typhoid fever is present in all our cities, giving an annual death-rate of from 15 to 100 and over in every 100,000 of the population; but, in the enumeration of its causes, its prevalence is ascribed to many unsanitary conditions before mention is made of the public water-supply.

It is allowed in certain local epidemics to be propagated from wells which have been infected by an infected sewage; but the sewage in the public supply is seldom considered other than as a sentimental objection of the use of the water. It is held by some that in many instances there are leaks in the plumbing of houses, by which exhalations from infected sewers reach the interior of the dwelling, but the water-supply into which the sewage of these very sewers is poured is used without a thought of its deadly qualities, unless, as in the case of Plymouth, Pa., the fact is forced upon the public mind that a public water-supply has as little disinfecting power over the germs of typhoid fever as the private supply of an infected well.

In this country the relation between the distribution of a water that contains sewage and the prevalence of typhoid fever can readily be observed by any one who studies the mortality returns of our cities in connection with the character of their water-supply. The records are fairly complete and trustworthy for the past fifteen years. Brooklyn, New York, Boston, Cincinnati, and Philadelphia have a death-rate from typhoid fever proportioned to the quantity of sewage which enters their water-supplies. Where the water-supply, as in Brooklyn, is comparatively free from sewage, the death-rate is low, averaging 16 to each 100,000 of the population for the fifteen years from 1874 to 1888 inclusive, reaching the maximum in 1885, with 23 to each 100,000, and the minimum in 1879, with 10 to each 100,000.

The following is the number of deaths in each year for each 100,000 of the population of the city of Brooklyn :

1874.....	17 in 100,000	1882	15 in 100,000
1875	21 " "	1883	14 " "
1876.....	17 " "	1884.....	16 " "
1877.....	16 " "	1885	23 " "
1878.....	11 " "	1886.....	17 " "
1879	10 " "	1887.....	18 " "
1880.....	12 " "	1888.....	19 " "
1881.....	17 " "		

Where care is exercised in excluding sewage from the water-shed which furnishes the public supply, there is corresponding freedom from typhoid fever. New York has a death-rate of 25, Boston loses about 40 annually for every 100,000 of its population. In Philadelphia and other cities, in which less attention is given to the purity of the public water-supply, the typhoid death-rates are correspondingly increased. The records of some of these cities give interesting information when viewed in connection with the history of the water-supply. Baltimore has had a steadily diminishing rate since its water-supply was first introduced, and the decrease has been more notable since 1880, when the supply was largely extended. This improved condition is not due to the introduction of a system of sewerage, but to the use of a purer water than was formerly furnished by its infected wells. Ordinarily a sewerage system and public water-supply are contemporaneous improvements, and any benefit to the health of the community has been credited to the sewerage, although it seems as if the inflow of a wholesome water, free from infection, has really more to do with the lessened death-rate, for the small typhoid rate of New Orleans cannot be attributed to the sewers of that city, since it has none, but it may be attributed to its water-supply, for that consists of rain-water, which is free from sewage; the cisterns in which it is stored are not sunk in the soil, but raised above the level of the ground.

In Vienna, from 1851 to 1874, well-water of an impure character was used to a large extent in addition to a systematized supply from the Danube. During this period the deaths from typhoid fever ranged from 100 to 340 annually in every 100,000 of the population. In the last-mentioned year a spring-water was introduced, and the death-rate from typhoid fell immediately to 50. Since then, by the disuse of impure wells and the extension of the new supply, the rate for the past four years has fallen to 11. As the sewerage system was in existence during the period of high rates, the fall since 1874 is necessarily referred to the use of water which is free from infected sewage. The fall

in the typhoid rate experienced an interruption in 1877, when, owing to the freezing of some of the sources of the spring-supply, the water of the Danube had to be pumped into some of the mains. It is of importance to note that the section of the city chiefly affected by this epidemic was that supplied by the water of the Danube.

In the face of such testimony to the influence of a pure water on typhoid fever, we cannot shut our eyes to the relation that exists between sewage in our streams and typhoid fever in the cities supplied by them.

THE DIAGNOSIS OF TYPHOID FEVER.

BY STEPHEN E. FULLER, M.D.

Read before the Medical Society of the County of Kings, September 18, 1889.

The diagnosis of typhoid fever is a very extensive subject for one to review in the brief time I have been able to devote to this paper, and it is also one of great difficulty; it will, therefore, be my endeavor to shed a little light upon the subject as it has presented itself to me during the past ten years of my practice in this city, and to ask your indulgence for my shortcomings.

It is the language of a recent writer on this subject, that "the diagnosis of typhoid fever up to the time of the appearance of the exanthem, constitutes one of the most difficult problems of practical medicine, and when we remember that there is no one symptom which can be considered pathognomonic, not even the eruption, and the many irregular cases differing so essentially in the symptoms which mark the onset of this disease, we shall, I think, find sufficient reason to agree with him.

In attempting to solve this problem it will be an advantage to us to have a clear idea of the symptoms of this disease when it pursues its so-called regular course, and by this standard we may the better judge the symptoms presented in an irregular case.

If called to a case with something of such a history as the following, viz.: that the patient has not been feeling well for ten days to two weeks, but has suffered from a persistent headache, a feeling of great muscular weakness, loss of appetite, dizziness—perhaps a slight attack of epistaxis, chilliness, alternating with hot flashes, until he feels too ill to get up, and you find a swollen and coated tongue, pulse 100, temperature 99° to 101°, there is pretty good evidence of a commencing

case of typhoid fever. If this disease is prevailing at the time, it will be an additional piece of evidence, as will also his age if under thirty-five years. The matter of sex will not prove of much assistance, in my opinion, though many writers on the subject believe the disease to be much more frequent in males, still, if this be true, it could give us very little assistance in a particular case. The fact that the patient had been absent from the city within a month would have a good deal of weight with me. The temperature will be now of the greatest assistance to us, as it rises gradually higher and higher each morning and evening, until by the end of the first week (7 to 9 days), the evening rise will reach 105° , or even more in severe cases; with the rising temperature will be a corresponding increase in the frequency of the pulse, reaching by the end of the week 120 or 130 per minute. There will also be some tenderness in right iliac fossa, with gurgling upon pressure; the enlargement of the spleen will be easily detected, perhaps some tenderness over the region of the liver, with scanty and high-colored urine, showing perhaps a trace of albumen. Now comes the exanthem from the sixth to the tenth or eleventh day, and *finding* this (and it should be *sought* for), the diagnosis will be complete.

It is understood that at the first visit to any patient who is shown by the thermometer to have a rise of temperature, a thorough examination is to be made to ascertain if there be present any local inflammation of which the pyrexia may be symptomatic.

Different authors mention a great many different diseases whose initial symptoms are such as to render the diagnosis of typhoid fever a difficult task; such as gastro-enteritis, malarial fevers, acute tubercular meningitis, acute phthisis, etc. It is plainly unnecessary for me to go over the distinguishing features of each and every one of these diseases, and I will therefore confine my remarks to that one of these diseases which seems to me most difficult to diagnose and which I am sure has given me the most trouble, acute phthisis. During the past year I have met with two cases of this disease whose resemblance to typhoid fever was so great that neither myself nor several of my friends was able to differentiate between these diseases until the non appearance of the exanthem and the irregularities of the temperature caused us to rule out the typhoid fever. In one of the cases we had grave doubts almost to the end.

An ephemeral fever will not, as a rule, give us much trouble, running its course as it does in four or five days.

Any continued fever, lasting ten days or more, I should consider typhoid. I have no knowledge of so-called gastric fevers running from three to six weeks.

Having never met with a case of continued malarial fever, and

such evidence as has been adduced to prove its existence not being sufficient to convince me, I do not believe in its existence. All the malarial fevers I have seen have been either intermittent or remittent, and these features will serve for purposes of diagnosis. There is, however, a form of typhoid fever frequently met with in this city during the Fall and Winter months, which is not easy to diagnose, and which is frequently called a remittent or bilious remittent. This form of typhoid fever has an interesting history, and with your permission I will briefly give it.

During the year 1862, while the army of the Potomac lay encamped along the flat and marshy banks of the Chickahominy River, a disease broke out among the troops, which presented several features with which the medical officers of the army were unacquainted. Idleness among soldiers is always a cause of disease, and this with their scorbutic diet and the malaria poison to which they were constantly exposed was by some believed to be the cause of the frequency and the peculiar symptoms of the disease. Others believed it to be typhoid fever modified by the above-mentioned diet and the malaria poison as well. The disease became commonly known throughout the army as Chickahominy fever. Dr. J. J. Woodward, who had been for a time on duty with this command, was transferred to the office of the Surgeon-General, and was upon a committee appointed to revise the nomenclature of the monthly sick reports of the army. Up to this time these reports bore the names of typhus, typhoid and malarial fevers only; on the 30th of June, 1862, Dr. Woodward put forth the new term typho-malarial fever, which he then believed to be a new disease, as he himself styled it a hybrid born of typhoid and malarial poisons. Notwithstanding the fact that many of the most experienced and able men in the medical corps of the army did not subscribe to the views of Dr. Woodward, this term became at once the fashion. Its popularity is well shown by the sick reports of the first year after the coinage of this term, for 27,399 cases of typho-malarial fever were reported during the year; more than one-half of all the cases of this disease reported throughout the whole period of the war, the exact number being 49,871.

The introduction of this name was unfortunate, because Dr. Woodward did not at first make it clear to others just what his idea of this disease was, thus leaving it a convenient name to apply to any fever which one did not care to study and yet which must have a name on the sick report, and still more because many accepted what were believed to be (and undoubtedly were at the time) the views of Dr. Woodward that it was a new disease.

It was not until the meeting of the International Medical Congress,

held at Philadelphia in 1876, that Dr. Woodward clearly defined his views upon this subject, which he then explained in these words: "Typho-malarial fever is *not* a specific or distinct type of disease, but the term may be conveniently applied to the compound forms of fever which result from the combined influences of the causes of malarious fever and typhoid" which being interpreted, means simply that Dr. Woodward recanted his former views, and admitted that the disease was typhoid fever occurring in a person whose system was more or less saturated with malarial poison, and this was the opinion which was held all along by many of the army surgeons both before and after the new name was promulgated. As the malarial poison is present in greater or less amount, so is the typhoid more or less masked by it, but the *lesions* are the *lesions* of typhoid fever.

Many cases of this form of fever came under my care during the war, and with some allowance for difference of diet and general surroundings, just such cases come under my care in this city every Fall and Winter.

I cannot better show the manner of invasion of this disease than by quoting briefly a case or two from my note-book.

CASE I.—S. E. V., thirty years old, American, merchant, called me at 7 o'clock P. M., on November 11th, 1886. I found him lying on a lounge, and learned that he had just returned from a business trip to the West; had been feeling bad for a day or two, and just after reaching home on this day had been seized with a severe chill; he was now feeling very hot, complaining of headache and great thirst. Temperature 105° and pulse 100; tongue swollen, and covered with a white coating. A cathartic was ordered and quinia in full doses. The next morning his temperature was 103° , pulse 94; and from this he went on through an attack of typhoid fever with the usual symptoms, well marked exanthem included, and was confined to the house for six weeks. Quinia was administered freely throughout the attack.

CASE II.—George M., American, twenty-one years old, clerk. Called at my office on the afternoon of October 10th, 1887. Said he had not been feeling well for a few days, and this morning had a hard chill. I found his temperature $105\frac{1}{2}^{\circ}$, pulse 120, and ordered him home and to bed. This proved more severe than the first case, he having several severe attacks of epistaxis, very severe diarrhœa, characteristic typhoid stools, hæmorrhage from the bowels, copious eruptions, which came out in crops, as one faded a fresh one appeared. His illness laid him up for three months, and all the way through the typhoid symptoms, although so well marked, were dominated by the malaria poison, showing itself in frequently-recurring

temperatures of $105\frac{1}{2}^{\circ}$, also in a double rise of temperature every twenty-four hours, a feature I have often noticed in these fevers. During his convalescence on two or three occasions his temperature ran up to 104° and 105° , when it had been ranging at 99° to 100° for days. Quinia in large doses always reduced the temperature.

These cases are the same in character as those called typho-malarial by Dr. Woodward, and they are strictly within the limits of his 1876 definition, and I see no objection to the use of this term, provided we remember that the typhoid poison is there as well as the malarial.

Those who believe in a continued malarial fever running on until the high temperature and other debilitating causes produce what is known as a typhoid condition, and call this fever typho-malarial, are not in accord with Dr. Woodward in 1862 nor in 1876. Such a disease I have never met with, and, therefore, know nothing about it.

To sum up this matter, typhoid fever, in what may be called the regular, classic type of the disease, with its prodromic stage, the gradually rising temperature of the first period—seven to nine days—the regular appearance of the exanthem, the steady maintenance throughout, the second period of the temperature reached at the end of the first, and then its regular course in the third period until it reaches the normal standard, or perhaps drops a little below, and the patient passes on to convalescence—this is not the usual type of the disease as I meet with it in this city. On the contrary, such cases as are related above are those I am accustomed to see. With abrupt beginning, an initial high temperature often following a decided chill. The fever following no regular course, two rises of temperature in each twenty-four hours being usually the case, constipation throughout the whole course of the disease in many cases, and convalescence interrupted by frequent high temperatures resembling an intermittent.

I can add nothing further in the way of diagnosis, for it will, after all, depend largely upon the appearance of the exanthem, and to make a diagnosis before this appears will be a matter of personal experience and judgment.

TREATMENT OF TYPHOID FEVER.

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Read before the Medical Society of the County of Kings, September 18, 1889.

In the general study of the treatment of typhoid fever, the etiology of which is still in doubt, many remedies will be found, suggested by as many observers. This is in itself proof positive that its successful treatment is still a question. Physicians do not differ on established

facts, and most of the professional controversies grow out of ignorance of the cause of disease. Theories are conceived to sustain views, and each one seeks to maintain his favorite theory, by wordy combat. The only advantage gained by these conflicts of opinion being, that among the multitude of theories set forth, enough of facts may be found upon which to establish a rational and successful line of treatment.

In the management of typhoid fever the hygienic is the first to claim attention; and here we cannot be too careful of details. Good ventilation is absolutely essential, and this means a large airy room, devoid of carpet, tapestries, etc., and with only furniture sufficient to meet the needs of the patient and attendants. The ventilation should be free, even slight draughts will do no harm, public opinion to the contrary, for fever patients rarely, if ever, take cold.

The so-called half-bed, or single bed, is to be preferred as more comfortable for both patient and nurse, as the constant demands of the fever patient makes it imperative that he should be within easy reach.

Sunlight is an essential element in the hygienic management of fevers, and if possible a case of continued fever should never be treated in a room where the sunlight does not enter. Such a room is undesirable for those in health, and is still more so for the sick. All conversation should be in the ordinary tone of voice, which is the most natural and agreeable, and least likely to arrest the attention of the drowsy sufferer. Tip-toeing, whispering, and the "sign language" in the sick-room are relics of a bad system of nursing, of which, happily, we are now almost free. The temperature of the room should not be above 70°, and even a lower temperature is desirable.

The discharges of the patient should be disinfected at once. By a little additional care on the part of the nurse, they can be received in a disinfecting solution previously placed in the bedpan, but to make protection more perfect, boiling water should be poured over the discharges before depositing in the water closet or in the ground. A weak solution of permanganate of potash will almost certainly protect from contagion, but the boiling water will certainly destroy every vestige of contagion found in the discharges. Any soiled clothing or linen should at once be placed in a chloride of zinc solution, and afterwards be boiled.

Absolute rest for the patient, both mental and physical, is very necessary, and the earlier it can be secured, the more favorable the prognosis. Active business and professional men often "keep up" until greatly exhausted, thereby becoming bad subjects for a long and wasting disease.

During an epidemic of typhoid fever, every case of diarrhœa, associated with elevation of temperature, should be treated by rest, until

the temperature returns to the normal and remains there. To "work off" the feeling of lassitude incident to commencing typhoid is impossible, and the attempt may cause irreparable injury. With absolute rest to the patient, comes the attention to details on the part of the physician and nurse. He must not be allowed to lie too long in one position, especially on the back. By frequent changes the formation of bedsores and hypostatic congestion may be avoided. It is a good plan to have the patient fill his lungs fully several times in the day. This precaution tends to maintain the functional activity of the lungs throughout their full extent, and also lessens the danger of congestion of the dependent portions.

The region of the bladder should be examined by the physician at each visit, and resort should be made to the use of the catheter if the viscus is unable to empty itself.

Strict attention to cleanliness, in all that the term implies, is very essential in this disease. The mouth of the patient should be kept clean by a solution of borax, or, perhaps still better, Dobel's solution; or, if the patient is conscious, a weak solution of hot water and salt may be used with advantage. If the mouth be neglected, the danger of stomatitis, parotiditis, and inflammation of the middle ear is increased.

The subject of drinks for a fever patient is of great importance, and one upon which we have a variety and often a diversity of opinion. Water stands first on the list. Patients suffering from fever from any cause demand an abundance of good, pure water. A liberal supply is necessary to facilitate the elimination of waste products due to the rapid disintegration of tissue, the result of high temperature. These waste products should be eliminated as speedily as possible, otherwise they add to the poison, inducing secondary intoxication, and greatly interfering with the functions of various organs. All the water used as drink by the patient should be boiled, and cooled to the ordinary temperature or lower. It has always been a question in my mind whether the use of ice and iced-water should be encouraged. The use of iced-water in health will not stand the test of scientific scrutiny, whatever our perverted tastes may cause us to say to the contrary. The argument is offered that in raising ice and ice-cold water to the temperature of the body, a certain amount of heat is abstracted, and in so much, it is a move in the right direction. The question now arises whether the small gain equals the disadvantage. If ice is held in the mouth and allowed to melt, it contracts the blood-vessels and gives a sense of refreshing coolness, which is very grateful; but soon the contraction of the vessels gives place to dilatation, and as the hot blood surges back into the vessels,

the mouth becomes dry and hot, and the subsequent discomfort outweighs the short-lived pleasure. The secretions thus become interfered with, the mouth dry and sticky, the teeth covered with sordes, the formation of which the use of ice seems to favor. I always use the water at the ordinary temperature. The patient accustomed to iced-water will object at first, as he would in health, but he soon forms a taste for it and is well satisfied.

Furthermore, from some observations I have recently made, I am inclined to believe that an occasional drink of hot water, seasoned with a little coffee or mineral acid, as hydrochloric, is of decided benefit. In the few cases where I have used it systematically and where the patients were conscious and able to give a rational judgment, they have said the hot water gave greater relief from thirst, and for a longer time, than either iced-water or water at the ordinary temperature. The hot water seems to favor secretion by dissolving off and thinning theropy mucus and by stimulating the mucous membrane. What is true of the mouth must in a great measure be likewise true of the stomach. My observations have not been sufficiently extensive to give great weight to this statement, but I give it for what it is worth. In all cases of fever water should be administered with the utmost regularity, whether the patient ask for it or not, and its use should be carefully timed. If hot water be used, a small amount before food will be of advantage; but a large quantity of water should never be given just after taking of any kind of food, for it is very liable to interfere with digestion. Alimentation must receive most careful attention. The only real source of strength is food, and whatever action is obtained from medicine depends upon the inherent strength of the patient, and the source of that strength is food. Graves, in his excellent writings on fever, says: "The great object of treatment in typhoid fever is to prevent patients from dying from starvation." There are two dangers to be guarded against in the administration of food—too little and too much; and perhaps of the two evils the first is the less dangerous. Sufficient time should elapse to allow of complete digestion before new material is taken into the stomach—at least three hours in ordinary fevers. Fever patients should be treated as dyspeptics, for such they are for the time being. The ideal food is milk, and its mode of administration should receive due attention. The amount should be regulated by the digestive powers of the patient. From three to five pints of milk, with an occasional meal of expressed meat juice during the twenty-four hours, will be amply sufficient for the ordinary case. If diarrhœa is a prominent symptom, I am accustomed to add flour, which has been boiled from ten to twelve hours—a suitable food for infants

suffering with entero-colitis and equally valuable in typhoid fever. Patients tire of one kind of food, and it is well to vary the taste as much as possible by the addition of coffee, tea or cocoa. The addition of salt to the milk is also of great value. To the meat juice a little hydrochloric acid may be added, and a small dose of the hydrochloric acid, two hours after the milk, will aid in completing the conversion of food.

The use of beef-tea, as ordinarily prepared, is to be interdicted. Its food value is very low, its constituents being too far along in the retrograde to afford material for tissue building, and it being open to another objection, the laxative effect on the bowels—an action to be avoided in typhoid fever. If constipation exists, other and safer means are at our disposal. If the function of the stomach is greatly interfered with, recourse must be had to food more or less digested, in the form of peptonized milk or peptones. In all cases the stools must be examined for undigested particles and the amount of food measured by the appearance of the discharges. Not infrequently skimmed milk is better borne than whole milk; the fat if undigested undergoes chemical change and becomes an irritant to the mucous membrane. A small amount of food thoroughly digested is far better than a large amount partially digested, the residue being placed under the most favorable condition for rapid chemical change, and as results we have gaseous distension, discomfort and danger. In many cases of fever, attention to the food is about all that is required, and in the more severe cases it is all important. The use of alcohol in fevers has been the subject of much discussion, and at the present time we have directly opposite views from men of equally high standing in the profession, one physician avoiding its use as not only useless but harmful, another making alcohol a prominent factor in the treatment. I can only give my own view and mode of use.

Alcohol is both a food and a stimulant. It is an easily burned hydrocarbon, and when given in proper quantities is burned in the organism and so far protects the tissues; but in order to use it successfully as a stimulant, we must bear in mind its double action. When used as a stimulant, the dose should be measured by the effect, for over-stimulation will be followed by a corresponding condition of depression, which is always harmful; and as the dose is increased in the false hope of overcoming the depression, the danger is likewise increased, a good rule for its administration being when it brings the patient more nearly to a condition of health it should be employed, but when it takes him away from that standard, its use should be discontinued. At what period of the disease should the use of alcohol begin? In young persons, unaccustomed to the use of any

kind of stimulants it may not be, and generally is not indicated throughout the disease, but in those past middle life, those prematurely old, and those accustomed to its use, it is almost always indicated at some period of the disease. The condition of the circulation, systemic and capillary, is an excellent guide to its use. If the pulse in the adult is above 120, it denotes weakness in exact proportion to its frequency. If the first sound of the heart becomes indistinct or inaudible over the apex, the demand for stimulants is imperative, and alcohol should be one of the number. It will not do for us to follow the teachings of writers in foreign countries, where wine and beer constitute the daily drink, for the amount of stimulant recommended would be positively harmful to one unaccustomed to its use. It is a safe rule of practice to delay the use of alcohol as long as possible, and when once begun to watch the effect of the first few doses very carefully. In the administration of alcohol, it is well to give it diluted in water rather than in milk, as when taken with milk it may lead to a great disgust for this form of food—a repugnance difficult to overcome. We should ever bear in mind to avoid the use of medicine in gelatine capsules while administering alcohol, the alcohol preventing the solubility of the gelatine and thereby causing the loss of the medicine. The vital powers being at the lowest about 3 A. M., it is at this time that stimulants are needed, if at any.

THE MEDICINAL TREATMENT.

This is indeed varied, and the practitioner can take his choice. By one writer the cases of typhoid fever are divided into three classes.

1st. The benign cases, which require watchfulness without active interference.

2d. The grave cases, which are serious, but of which the prognosis is favorable with the proper treatment. In this class we encounter two dangers. 1st. Hyperthermia. 2d. Putrid infection.

3d. Cases which are hopeless from the first and die rapidly.

The second class receives the best endeavors of the physician.

During the first week the treatment is mainly directed to the comfort of the patient. The disease cannot be aborted; once begun it runs its course; and the duty of the physician is to watch for complications, and meet indications as they arise. This form of symptomatic treatment has been named, not inaptly, “armed expectancy,” and it has also been termed the “medication of indications.” In the early part of the disease headache requires attention. Palliative measures, such as cold to the head, evaporating lotions or cologne water may be employed; but if it does not yield to these milder measures, the ice-cap may be used. Not infrequently the med-

icinal agents employed to reduce the temperature will control the cephalalgia very promptly, especially phenacetin in from five to ten grain doses every three or four hours. In the early stages of the disease, when the pulse is full and strong, hydrate of chloral meets two indications: it relieves the headache and has a certain action in lowering temperature. It must be borne in mind that the action of chloral is to diminish arterial tension and weaken the action of the heart, and these are the principal factors in the reduction of body temperature. The bromides have been recommended, but have not proved valuable in my hands. Insomnia is a distressing and exhausting symptom, and it often merges into the low muttering delirium so characteristic of typhoid fever. If the remedies used to control the headache fail to induce sleep, then recourse must be had to opium; and if the trembling and the muttering delirium become marked and continuous, camphor, in doses of two to five grains, is simply invaluable. If the pulse is full and strong, a small amount of antimony, $\frac{1}{40}$ grain, may be added with excellent effect.

By the end of the first week all depressing agents, such as aconite, veratrum viride, etc., must be discontinued if previously employed, and if the fever is high, this will engage the attention of the physician. If the fever range is not above 103° , the danger to the organism from the fever alone is very slight; but if it ranges 104° to 105° , it must be controlled; and at the present time many agents are at our command. Among the German physicians the cold bath is esteemed very highly as an antipyretic, and that it is a means of great power cannot be denied. Among the majority of active practitioners in this country it is not used, its many disadvantages in private practice hardly warranting its general employment. The tepid bath has less objections in the mind of the public, and is often employed with good results, especially in the typhoid of children. Cold sponging is a useful measure, but does not possess the decided antithermic power of the cold or tepid bath. The wet pack has been used with great advantage, and can be employed in private practice with very little disturbance to the patient. With so many excellent antipyretics at our command, it does seem that the fever should be controlled by the less perturbing measures.

Again, the individual symptom "*fever*" has, in my judgment, too fully occupied the attention of the profession to the exclusion of other conditions dependent upon the initial lesion and secondary intoxication. With our numerous febrifuges we are led at times, I fear, to fit the case to the remedies, rather than the remedies to the case. The fever is but one symptom, and to a certain extent a necessary condition for the elimination of the poison. To direct our main

energies to this symptom alone is bad practice. The nervous, circulatory and respiratory systems require careful watching, and remedies directed to them are almost always indicated in cases of any severity. The profound and dangerous impressions made upon these organs are due not to the fever element alone, but to the secondary intoxication, the result of the disease. The fever at no time may have been excessive, and yet the patient is about to die from failure in one or more of the great vital organs. In typhoid fever especially is the oft repeated injunction of Cullen applicable: "Watch the workings of the great vital organs. Watch the outlets of life, and obviate the tendency to death." If from hyperthermia, treat accordingly with antipyretics internally or the baths; if from failure of heart, stimulants—strychnia, strophanthus, and especially sulphate of sparteine, if the danger is imminent, or the hypodermic use of camphor, one part to pure olive oil four parts, or the subcutaneous use of ether. In my judgment the camphor is the most certain in its effects, and by far the most sustaining. If danger threatens on the side of the respiratory centres, then the free use of strychnia by stomach or hypodermically, and belladonna in small doses.

Digitalis has been by some strongly recommended in enteric fever, not only as a cardiac stimulant, but as a febrifuge, and as strongly condemned by others. In my judgment its use is very limited in typhoid fever, and should be interdicted after degenerative changes have become fully established. It acts powerfully upon the muscular structure of the heart, energizing its systole and tightening the arterioles to such an extent that the excitability of the laboring organ is soon exhausted and cardiac failure may result from the use of one of the best cardiac stimulants. The happy action of the drug at first gives confidence, and may be useful, but if continued too long it becomes harmful by over stimulation.

To combat the hyperthermia, antipyrin has been largely used and favorably endorsed, and it is no doubt a very valuable agent; but from personal observation I believe antifebrin is the safer and better remedy. In proper doses it is perfectly safe and does not depress the cardiac or respiratory centres to any marked degree, rendering the patient very comfortable by its soothing effect on the nervous system. It also acts as a stimulant to the vaso-motor nerves, increasing arterial tension. The doses usually recommended are too large except in special cases; one to four grains should be the dose. This is mild and non-irritating, and by anticipating a rise in temperature we can, as a rule, fully control the ordinary fever heat. A safe practice is to anticipate the afternoon or evening rise by several small doses of antifebrin, and not produce those marked fluctuations of temperature so enthusiastically

described by many writers. If we can keep the fever within safe bounds— $102\frac{1}{2}^{\circ}$ or 103° in the morning to $103\frac{1}{2}^{\circ}$ to 104° at night—the patient will be more comfortable, the disease run a safer course, the period of convalescence occur sooner and be more complete, than when the marked fluctuations of temperature are induced by artificial means. The disease is self-limited, and it should be the aim of the physician to conduct the patient through it with the least possible disturbance to the organism. A remedy powerful enough to produce a fall of 3° to 5° of temperature, with profuse sweating, great prostration, etc., is not wholly devoid of danger.

The use of salicylate of sodium has been strongly recommended and largely used. I cannot endorse its use in typhoid fever. Not infrequently, when given in rheumatism, a disease in which the nervous system is not profoundly affected, it will produce “therapeutic delirium,” and certainly it is not wise to add to “ataxic delirium” a new factor, in the hope of securing a possible antiseptic and antithermic action. In the treatment of temperature it is very important that a correct diagnosis of the cause should be made. Not infrequently the temperature will go up one or two degrees from an attack of indigestion or food decomposition, or from over-distension of the bladder or a loaded bowel, and to treat such condition with antipyretics is simply folly, if nothing more. The rise in temperature is only an effort of the organism to correct a mistake and burn off the retained products.

Quinine in large doses has been used, and in many cases acts decidedly in reducing the body heat; but the general use of quinine in typhoid fever, in other than tonic doses, is not indicated. I am aware my views concerning the value of quinine in this disease are at variance with those of many excellent observers.

The so-called antiseptic treatment of typhoid fever is a valuable addition to our therapeutics. It is well to begin antisepsis at the mouth by strict cleanliness and antiseptic washes. Carbolic acid is a deserving remedy, and one in which I have much confidence.

R̄	Acidi carbol.,	-	-	℥ xxiv.
	Glycerin.,	-	-	3 ii.
	Liquid pepsin. aromati.,	-	-	3 i.
	Aquæ menth. pip.,	-	-	3 ii.

A teaspoonful one hour after food.

This combination aids digestion, checks decomposition, and acts as a disinfectant. To this may be added a drop of tinct. of iodine to each dose, but I rarely use the latter.

Naphthol is another valuable disinfectant which has been added to the list within recent years. This should be given in capsules in five

grain doses every four hours. It is nearly insoluble, and acts as a disinfectant by its unchanged presence in the bowels. Its action on the urine is to be borne in mind, giving it a deep brown color.

The bichloride of mercury has also been used as a disinfectant, but its action on the bowels is too laxative when diarrhœa is present; but in cases where constipation exists it may be employed with advantage.

The management of special symptoms requires attention. Epistaxis at times becomes a troublesome and exhausting symptom. Plugging the posterior nares and other means have been resorted to, in order to control the hæmorrhage. The simplest and most effective measure is to put the feet in hot water, and allow the feet and legs to become red from the warmth. This will almost invariably control the bleeding. The diarrhœa is not only a diagnostic, but a troublesome symptom. If the number of stools does not exceed three in the twenty-four hours, medication is not necessary; but if the drain becomes exhaustive, it must be checked, and kept, if possible, within safe bounds. Opium is the most valuable agent in the management of the diarrhœa. Opium has other numerous advantages in typhoid fever, and the use of small doses of the *gum* has become almost a routine treatment with me in this disease. The dose should not be large—one-eighth to one-sixth of a grain every third or fourth hour, or more frequently. It has an excellent effect upon the nervous system and a marked sustaining action upon the heart. Having made numerous observations upon the use of small doses of opium in typhoid fever, I feel able to speak with some confidence of its action and usefulness. I have made numerous observations of its action in safe cases. Having used it for some time, I have withdrawn it, and found the ataxic symptoms become more pronounced, the heart grow feebler, and, if delirium was prominent before, it became more pronounced; and again resuming the drug, all the symptoms have abated and become less marked. It diminishes the peristaltic action of the bowel, and has a direct action upon the sympathetic nervous system. The action of small doses of opium upon the peripheral termination of the vaso-motor nerves tends to prevent the dilatation of the vessels which the local disease produces, thus in a measure aiding to relieve the congestion and in promoting recovery. In short, it lessens peristalsis, and thus diminishes the local irritation. It also lessens reflex activity of the centres through which local irritation causes dilatation of the vessels, and thus diminishes the intestinal irritation. Again, the action of small doses of opium is to increase the flow of urine—an object greatly to be desired in fever with a dry, inactive skin. If the diarrhœa cannot be controlled by opium, other agents may be added, such as nitrate of silver, acetate of lead, and bismuth sub-

carbonate. If the diarrhœa is due to undigested food, a mild laxative may be given and the form of food changed or reduced in amount. If due to irritation low down in the bowel, the laudanum enema is very serviceable.

If constipation exists from the outset, small and repeated doses of a saturated solution of magnesia sulphate may be used. By giving it in a concentrated solution, it acts by osmosis, and tends to unload the congested capillaries of the intestinal tract—an abnormal condition well marked in the early period of the disease. Sulphate of soda has been highly recommended, and perhaps its action is somewhat similar. If there is danger of setting up hypercatharsis by the use of medicinal agents, then enemas are serviceable, and the very best and the least disturbing is glycerine; one to three drachms is all that is required, and the effect is speedy and effectual. At least one movement a day is required for the safety and comfort of the patient.

If there is much tympanites, turpentine may be added to the ordinary enema. There has been some discussion of late in regard to the value of turpentine as a therapeutic agent in typhoid fever. In observation upon the use of the drug, I am led to believe its most important value lies in its action upon the sympathetic nervous system. It acts on the vaso-motor centres, producing contraction of the arterioles and small vessels; it stimulates the heart and sustains that organ through the nervous system when about to fail, either from degenerative changes or fatigue. It acts favorably upon the mucous membrane of the bronchi and also as a disinfectant along the intestinal canal. As to its value in the later stages of the disease, there can be no question. The external use of turpentine is valuable, either in the form of turpentine stupes, or a better application—one part of vaseline and three of turpentine. This makes an oily mixture, quite stimulating, but which does not blister.

Vomiting is an occasional symptom requiring treatment. Not infrequently it is salutary and gives relief from over-feeding. If it should continue after the diet has been regulated, carbolic acid, or the aromatic spirits of ammonia, or bismuth may be given a trial. If in the early stages of the disease, equal parts of champagne and Apollinaris water is an excellent combination, or a wineglass of ginger ale will sometimes act admirably. In the later stages all aerated drinks should be withheld.

Intestinal hæmorrhage is one of the frightful accidents incident to this form of fever. When it occurs in the early stages, it is salutary rather than otherwise. It relieves the congestion, and in so much aids recovery. In the later stages it becomes a dangerous symptom, and prompt treatment is necessary. The amount of opium must be in-

creased, absolute quiet enjoined, and, if the case be severe, ergotin, three to five grains, given hypodermically ; astringents by the stomach are of little value. Ice over the abdomen is a valuable adjunct to other treatment. If perforation occurs, opium offers the only hope, and it must be used to semi-narcotism. Not infrequently, in the third or the beginning of the fourth week, cardiac failure and collapse are liable to supervene suddenly, and place the patient in imminent danger, and only prompt action will save from impending death. The hypodermic use of camphor, brandy, ether, or caffeine is imperatively demanded. The value of camphor has already been referred to, and in caffeine we have a most valuable heart-tonic and diuretic. It should be combined with sodium benzoate, the dose of caffeine to be at least five grains, to be repeated as the emergency demands. Small doses are not sufficient to accomplish the desired object, and large doses are necessary. The persistent use of the minimum dose has led to a lack of confidence in the efficiency of caffeine, whereas the full medicinal dose will sometimes give marvellous results. In states of collapse the function of the stomach is greatly impaired, or practically nil, and it is a mistake to continue to fill the stomach with food and medicinal agents during this period. Only the most rapidly acting stimulants should be selected, and those given hot, especially alcohol in the form of whiskey or brandy. To the alcoholic stimulant may be added, with good effect, tincture of capsicum—a cardiac and stomachic stimulant of no little power. With reaction comes the danger of over-stimulation, which may, in turn, produce a state of collapse, equal in danger to the preceding attack.

A word in regard to the so-called specific treatment of typhoid fever. There is no specific treatment.

Calomel has been largely used, and is well spoken of by eminent physicians, but to attribute to it any specific action in the cure of typhoid fever is an unjust claim. When given at the outset it acts as a laxative and disinfectant, and may serve a useful purpose. The mode of administration is as follows : six to ten grains with the bicarbonate of soda are given at night, this dose to be repeated later on if the disease is still in the first week. A few small doses—one-sixth to one-half grain—may be given from time to time as indicated. According to the advocates of this method, diarrhœa does not contraindicate the use of calomel. Other forms of so-called specific treatment have been instituted from time to time, but they are simply adjuncts to the symptomatic treatment so essential in all self-limited diseases. The management of convalescence is all-important in order to secure a full and complete recovery. Rest is still essential, and a liquid diet for at least a week after the normal temperature has been established.

For some months after an attack of typhoid fever, many persons cannot digest certain forms of starchy foods, especially potatoes. They give rise to flatulence and sometimes to diarrhœa, and the latter symptom is often unsuccessfully treated, without the cause being recognized. The occurrence of phthisis pulmonalis after typhoid fever is more than a coincidence, and may not this inability to digest starchy and fatty food be one factor in its production, especially when there is a predisposition to the disease?

The treatment of the complications and sequelæ of typhoid fever has been allotted to the able chairman of this committee.



THE COMPLICATIONS AND SEQUELÆ OF TYPHOID FEVER.

BY WM. MADDREN, M.D.

Read before the Medical Society of the County of Kings, September 18, 1889.

The complications and sequelæ of typhoid fever cover such a wide range that it is only possible in the time at my disposal to touch upon a few of the most prominent or most recently investigated. The purpose of this report may be best served by considering the occurrences separately, somewhat in the order of their frequency or importance.

The present state of our knowledge does not enable us to say why certain of the complications and sequelæ of typhoid fever prevail at one time and place and not at another, under, to all appearances, similar conditions.

Liebermeister, in 1874, made the statement that prior to that time it was considered an exceptional circumstance *not* to have complications and sequelæ in severe cases.

Now, the advocates of cold and other baths claim by their methods to have reduced them to a minimum, and furnish a mass of statistics to prove their position. Those who use chemical antipyretics assert that by keeping the temperature within certain limits, complications and sequelæ are lessened; while others who employ remedies that are thought to be germicidal in effect, think *their* treatment lessens the tendency and frequency.

From these statements we may, perhaps, gather that in regard to the complications and sequelæ of typhoid fever, the weight of evidence in recent contributions to the subject favors the view that they *are* lessened both in frequency and severity by the use of antipyretic, germicidal and other remedies.

PERFORATION OF THE INTESTINE.

Perforation of the intestine occurs, according to the late Austin Flint, in from eight to ten per cent. of fatal, and in from one to two per cent. of all cases. It is most frequent in men, rare in children. The same authority states the probability of successful medical treatment to be almost *nil*.

When perforation has taken place, it is important to avoid all movement of the patient; abstain from giving food or medicine by mouth or rectum for a time, and administer morphine, other remedies or stimulants hypodermically; quench thirst by holding cold water in the mouth, and, if not contra-indicated, bladders filled with ice, or the cold coil may be applied to the abdomen.

About the only hope of successful treatment of this condition seems to be in the employment of surgical means in certain suitable cases.

In October, 1885,¹ Lücke preformed laparotomy upon a case of typhoid perforation of the intestine, sent to him by Küssmaul. Since which time laparotomy has been performed for the cure of typhoid perforation by Mikulicz (Volkmann's Sammlung Klinischer Vorträge, No. 262, p. 9); Bartlett, of Birmingham (Ann. Universal. Med. Sci., 88, V. 2, p. 111); Bonticou, of Troy (Jour. Am. Med. Asso., Jan. 28, 1888); T. G. Morton, of Phila. (Med. News, Nov. 26 and Dec. 24, 1887); Wagner, of Königshutte (Centralblatt f. Chirurgie, 1889, No. 29, p. 66) reports a recent successful case in a woman convalescing from typhoid fever. The method was eventration of intestines, irrigation, suture of wound without drainage, and the result a complete cure.

The various suggestions for operative procedure are as follows: Should sacculation of the perforation occur, the sacculation should be opened and treated antiseptically. Lücke suggests the performance of the operation in two stages, the intestine to be fastened to the intestinal wall in the first—laparotomy, with the creation of an artificial anus—and resection to be performed later. Drainage and irrigation with disinfecting fluids he regards as important.

J. Ewing Mears² treats the indications and technique at length, and says, surgical interference is not justifiable until the fever has passed its height—at the end of the third week or later. In mild cases laparotomy may be performed after the above method, which permits of rapidity in operation.

¹ Deutsche Zeitschrift f. Chirurgie, Bd. 25, S. 1.

² Transactions Am. Surg. Soc., 88, V. 6

J. C. Wilson³ urges operative measures when the perforation has occurred in the period of convalescence.

Geo. R. Fowler⁴ quotes Steinthal, of Heidelberg, who considers laparotomy indicated where perforation occurs in ambulatory or mild typhoid, and supplies some points in the diagnosis of situation and technique. He adds: "In the fatal cases it has not been found that the operation itself has lessened the patient's chance of recovery, or that circumscribed has been connected with general peritonitis, as has been until now the generally expressed fear on the part of the medical practitioners."

PERITONITIS.

In peritonitis due to other causes than perforation, in addition to the usual course of treatment, I have used the cold coil upon the abdomen with satisfactory effects, as it has a large controlling influence upon temperature, and is pleasant and quieting to the patient. The application may be continuous, as long as the temperature remains above 101° F.

INTESTINAL HÆMORRHAGE.

Intestinal hæmorrhage is less serious than has been supposed by many.

Bleeding during the period of late healing is more grave as regards prognosis than during the period of sloughing in the second or third week.

Hæmorrhage in children is not so frequent as in adults, because of the superficial character of the intestinal ulcerations in the very young; although Parrot relates the case of a child three years old that died from a sudden intestinal hæmorrhage.

It is well to bear in mind that a sudden fall of temperature, collapse and death, may be the result of internal hæmorrhage into the intestine or elsewhere, without external evidence of its occurrence.

In profuse hæmorrhage threatening life, in addition to other remedies we may use ice-cloths, ice-bladders, or a lump of ice—to lose no time—applied to the right hypochondrium, bits of ice by the mouth, or ice-water enemas, ergot, and perhaps opium by the mouth or hypodermically. Jacobi⁵ discourages the hypodermic use of ergot in children, having seen gangrene over a large surface, and pyæmia several times, from its use.

Cozal⁶ contends that cold baths far from favoring the occurrence

³ Phila. Med. Times, 86.

⁴ Brooklyn Med. Jour., Sept., 1889, p. 558, 559.

⁵ Archives of Ped., December 1888, p. 714.

⁶ Ann. Uni. Med. Sci., 1889, Vol. I., II. 44.

of intestinal hæmorrhage, constitute an excellent means of preventing it.

Transfusion with saline solution may be of service in certain cases.

IN REGARD TO HÆMORRHAGE OTHER THAN INTESTINAL.

Epistaxis is as rare in children as it is frequent in adults; occasionally it is profuse, requiring arrest by mechanical means. Uterine hæmorrhage is not uncommon. Hæmaturia has been observed.

COLLAPSE—HEART FAILURE.

Collapse due to heart failure demands prompt attention. Among remedies alcoholic stimulants are of the greatest service. Digitalis, strophanthus, sparteine, caffeine, camphor, nitro-glycerine, and musk are useful adjuncts.

For combating a sudden danger from weakness of heart, Siberian musk in large doses is considered by several authorities a most efficient remedy. A subcutaneous injection of caffeine is superior to ether, is less painful, and more stimulating to the heart. Strong tea or coffee will produce a powerful temporary effect. When the indications call for a stimulating effect for a longer time, camphorated oil should be administered hypodermically—one part camphor, five parts olive or almond oil, two to five syringefuls at a time. In using this remedy be careful to vary the place of introduction, and use no violence, or there may be a slough of the skin.

DISEASES OF THE CIRCULATORY SYSTEM.

Eugene Beach⁶ says phlebitis, arteritis, endocarditis, pericarditis, thrombosis, embolism and infarctions, with their results, have been observed as occurring in connection with typhoid fever. Some of these conditions may be either complication or sequel, and may arise

⁷ Caffeine,	-	-	-	-	-	-	-	6 grains.
Salicylate of sodium,	-	-	-	-	-	-	-	4½ "
Distilled water,	-	-	-	-	-	-	-	Up to 16 minims.

Dissolve with the aid of heat. Sixteen minims contain six grains of caffeine.

—*Tanret and Dujardin-Beaumetz.*

Or,

Caffeine	-	-	-	-	-	-	-	50 grains.
Benzoate of sodium,	-	-	-	-	-	-	-	59 "
Distilled water,	-	-	-	-	-	-	-	Up to 224 minims.

Sixteen minims contain 3½ grains of caffeine.

From 3 to 4½ grains may be given every two hours.

Manual of Hypodermic Med. Wood's Monographs, Aug., 1889, p. 378.

⁸ Trans. N. Y. State Med. Soc., 1889.

from the action of the specific poison upon the endothelium, the condition of the blood or lymph, the state of the circulation and from external pressure.

Phillips⁹ reported a case of phlebitis occurring during convalescence from typhoid, in which both lower limbs and the superficial veins of the abdomen were affected; the patient recovered after a tedious convalescence.

Porter¹⁰ reports five cases of phlegmasia alba dolens, sequelæ of typhoid fever, all ending in recovery.

Beach¹¹ found in seventy-two cases of venous thrombosis of the lower extremities, eight proved fatal.

Liebermeister and Hutchinson speak of the possibility of death occurring from embolism of the pulmonary artery by detachment of a part of the thrombus. This I have seen, and think in some cases it may be guarded against by enforcing quietness for a longer time.

Thrombus of the heart in the third week is mentioned by Leduc and Duncan. Even when large it is not necessarily fatal. It is often fatal by being the source of pulmonary, hepatic, splenic, cerebral, and other embolism. Embolism, or thrombosis of the arteries of the lower extremities, may result in gangrene.

Beaumont reports a case in which both legs were lost by gangrene; the patient, a child, recovering.

Sumner, in his service in the Boston City Hospital, reports a case of fatal embolism in right axillary artery and gangrene of the arm.

Thrombosis occurs most frequently in femoral veins, next in the saphenæ, and third in the popliteal.

Mettler considers gangrene of the extremities due to endarteritis, and says local treatment consists in elevation of the limb, the application of leeches, followed by poultices, hot stupes, or, if more agreeable to the patient, cold water dressings. The circulation should be supported by means of alcohol and digitalis. The peripheral circulation should be stimulated by alternate applications of heat and cold. For this purpose the constant current battery may be used. After all efforts it may be necessary to make numerous incisions into the mortified tissues, and follow by proper surgical dressings.

BED-SORES

Bed-sores may be prevented by the use of a water or air mattress; by having the position of the patient frequently changed; by the appli-

⁹ London Lancet, 1885.

¹⁰ Trans. Conn. State Med. Soc., 1884.

¹¹ Trans. N. Y. State Med. Soc., 1889.

cation of protective plaster or dressing, and by attention to cleanliness. If they occur, the ulcerated parts are to be relieved by air-cushions, and treated by appropriate local applications.

NEPHRITIS.

The acute and milder form of nephritis in typhoid is considered by some as due to a special action of the specific poison upon the kidneys.

Geier¹² in writing upon nephritis and albuminuria in the typhoid fever of children, asserts that he has seen cases of typical acute parenchymatous nephritis and extensive dropsy in typhoid, and summarizes his conclusions as follows: Nephritis occurs in the typhoid fever of childhood just as it does in adults. The more intense conditions of this complication occur rather less frequently in children than in adults. There is no particular renal variety of typhoid fever in children.

RHEUMATISM.

A. Brayton Ball¹³ says articular symptoms occasionally occur as a complication and lead to the conclusion that typhoid fever, like scarlet fever, though much less frequently, may present joint symptoms apparently rheumatic; but whether such symptoms are a manifestation of typhic infection or indicate a complication with true rheumatism, must be decided by the special conditions of the individual case. In certain localities articular symptoms appear to be a very frequent complication of typhoid fever.

TYPHOID FEVER COMPLICATED WITH INTERMITTENT AND OTHER FEVERS.

Typhoid may be associated with intermittent or malarial fever, scarlatina, measles, diphtheria, and perhaps typhus, pneumonia, and acute miliary tuberculosis or phthisis.

Ewen¹⁴ publishes a case of typhoid followed by measles, parotitis, and sloughing of the face, in a child aged twelve.

Christi¹⁵ reports a case of measles developed during the course of enteric fever in a child eleven and a half, which terminated fatally.

Ringwood¹⁶ communicates notes of a case where the patient not only had typhoid fever and measles concurrently, but also a severe attack of diphtheria, followed by scarlet fever and chicken pox, all

¹² Jahrb. f. Kinderh., xxix., 1.

¹³ Med. Record, September 1, 1888.

¹⁴ London Lancet, August 4, 1888.

¹⁵ University Med. Mag., December, 1888.

¹⁶ London Lancet, July 7, 1888.

within the space of seven weeks. In the course of his communication he asks the following interesting question: "Was all this conglomeration of diseases only different phases of one continuous blood-poisoning, Nature's endeavor to expel the poison, resulting in violent storms, each storm being attended by a group of symptoms that we are accustomed to describe as different diseases; or did the germs of five different diseases live harmoniously and flourish synchronously in the blood of this sorely tried patient, feeding on the same diet, and avoiding internecine warfare; or did each attack, contrary to usual experience, leave in her system for food the germs of each successive disease?"

SECOND ATTACKS.

In 666 cases of typhoid fever treated by Eichhorst¹⁷ in Zurich during three years, second attacks occurred in 28 persons.

Susceptibility of typhoid infection was not destroyed by first or second attack. Cases of three and four times repeated infection were observed. Men are more liable to repeated attacks of typhoid than women. Murchison, Bartlett, Budd, Liebermeister and others instance a second, and state the possibility of a third or fourth attack.

PREGNANCY AND ABORTION.

Abortion is less frequent in typhoid than is generally supposed.

Lomer¹⁸ cites a case, four months pregnant, in which the patient's temperature was above 104° F. for some time. Recovery ensued. At term the woman was delivered of a healthy child.

Vincent¹⁹ treated three cases of typhoid in pregnant women by Brand's method, preventing abortion, and all were cured.

ULCERATIONS OF THE LARYNX.

Tissier²⁰ contributes an important paper upon the laryngeal complications of typhoid fever, to which is added a full bibliographical index.

In children, gangrene of the mouth, pharynx or larynx may arise. Prophylactic treatment consists in the uses of antiseptic washes for nose and mouth.

Oxygen inhalations in complications and sequelæ affecting the larynx and deeper respiratory tract, may be of great service.

¹⁷ *Correspondenz Blatt f. Schweizer Aerzte*, May 1, 1888; *Med. News*, June 16, 1888.

¹⁸ *Centralblatt f. Gynäkologie*, May 19, 1888.

¹⁹ *Gaz. des Hôpitaux*, 1887.

²⁰ *An des Mal. de l'Orcelli*, etc.

EAR.

More or less deafness is common during the course of typhoid fever, and may depend upon temporary changes in the ear or central nervous system. Where the deafness is more marked or prolonged it may be the result of catarrh of the pharynx extending into the eustachian tube. Inflammation of the middle or external ear, with or without perforation of the tympanum, is an occasional complication. The treatment is to be regulated by the accepted rules for those processes occurring independently of the typhic poison. Ulceration of the cornea is a rare complication.

CHILDREN.

Keating²¹ says of the complications of typhoid fever in infancy and childhood: "Among the various complications we may speak of bronchitis, which is more or less intense and is apt to be tenacious; broncho-pneumonia may supervene. In some rare cases the attack may begin with croupous pneumonia, masking for a time the typhoid element, and then run on and exist as a complication." In Parrot's experience this form is more frequent in children than in adults.

Gangrene of the mouth, pharynx or larynx may arise; parotitis is somewhat rare; aphasia may arise. Gerhardt has noted it about the third week in a boy between ten and eleven years. Paralysis is rare. Sudden death from this disease in childhood is also of extreme rarity. Perforation of the bowel is more rare in children than in adults, and, though intestinal hæmorrhage is not a common occurrence, it is by no means to be considered a sign of fatality.

Enteric fever in childhood is apt to be followed by tubercular infection.

SUDDEN DEATH.

Sudden death in typhoid fever may be due to hæmorrhage, embolism, or the like, uræmia due to nephritis, or by special localization of the infecting principles upon the pneumogastric.

In so far as the complications and sequelæ of typhoid fever may be regarded as the result of ptomaine or systemic intoxication, in the absence of remedies known to be antidotal in effect, there is a call for supporting and stimulating measures.

²¹ Arch. of Ped., June, 1888.

DEATHS IN BROOKLYN FROM TYPHOID FEVER, FROM JANUARY 1, 1874, TO MAY 1, 1889,
WITH DEATH RATE PER 1,000, AND PERCENTAGE TO TOTAL DEATHS.

BY JOHN S. YOUNG, M.D., DEP. COMMISSIONER OF HEALTH.

	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889
January.....	2	8	7	9	3	5	5	5	9	4	6	7	10	4	6	5
February.....	3	8	4	6	1	7	1	3	3	6	1	3	8	6	5	6
March.....	6	7	6	5	1	5	6	5	6	7	6	8	3	5	3	5
April.....	5	4	6	6	3	3	3	8	7	8	5	7	2	1	3	2
May.....	3	5	5	5	4	4	6	5	10	2	8	3	0	7	2	5
June.....	1	6	5	5	5	1	4	8	3	5	4	4	2	2	1	7
July.....	2	3	7	9	7	6	5	2	3	10	7	8	3	7	4	15
August.....	5	17	12	10	9	2	11	6	3	13	10	13	13	20	14	24
September.....	19	17	7	12	10	10	9	17	14	9	19	15	12	21	24	25
October.....	8	15	15	8	7	5	12	19	9	14	19	23	19	27	36	24
November.....	14	8	10	6	5	6	6	14	8	8	14	37	32	28	28	
December.....	10	7	4	1	4	5	3	7	12	7	8	25	19	15	27	
Total.....	78	105	88	.82	59	59	71	99	93	92	107	153	123	143	153	
Death rate per 1,000 of population..	.173	.217	.176	.160	.112	.108	.125	.170	.154	.147	.166	.230	.171	.189	.192	
Percentage of deaths to total deaths..	.708	.842	.714	.722	.533	.510	.537	.680	.619	.669	.759	.996	.779	.838	.847	

THE ELASTIC LIGATURE IN THE TREATMENT OF RECTAL FISTULÆ.

BY EDWARD P. CROWELL, M.D., BROOKLYN, N. Y.

From the time that the thread with a weight attached was used to cut through the tissue which forms the bridge between the rectal and external openings of these troublesome fistulæ, many devices have been presented to the profession, all of which have had for their object the removal of the trouble with as little pain and inconvenience to the patient as possible.

The thread and button have been used, but this method necessitates the tightening of the ligature every day or two, and this causes considerable pain to the patient. Then, too, the ligature cuts very slowly, unless it is frequently tightened.

There is quite a good deal of unnecessary suffering attending this method, and considerable inflammation is set up in the vicinity of the fistula. The patient often prefers his old fistula to the pain and suffering of the ever-present ligature.

It was with the purpose of removing the fistula with as little disturbance to the patient as possible, that I turned my attention to the use of the elastic ligature. Various kinds have been tried and have been discarded as useless. The one that has given the best satisfaction is the pure gum ligature, which is furnished by Tiemann, of New York. There are two sizes, of which the smaller is to be preferred.

In the selection of the cases which would be benefited by the treatment with the elastic ligature, the circumstances and the general health of the patient are our best guide. Many cannot be away from their daily business; many whose constitutions are not very rugged cannot stand the thought or the shock of the operation in which we employ the knife.

There are others whose fistulæ extend far up the bowel, whose chances of recovery are better with the ligature than with the knife. In some the fistulæ are entirely without the bowel, and which have become fistulæ by the bridging over of the two edges of an old fissure. In all these cases the ligature offers decided advantages over the knife.

Before the method of employing the ligature is briefly outlined, a word must be said concerning preparatory treatment. Previous to the passage of the ligature much can be done to render its operation less painful, if the sphincters of the rectum are stretched a little, so that the action of the external sphincter is temporarily paralyzed. This will quiet the spasmodic contractions of the muscle, and the patient will

endure the ligature with far less pain. To accomplish this a dilator or the rectal bougies may be used. This preliminary measure renders the work of the ligature nearly painless.

The introduction of the ligature may be effected by either of the methods that are commonly employed. The canula and concealed hook is a good instrument, but the whalebone guide, with an end adapted to receive the ligature, is equally good.

After the sphincters have been carefully dilated, the ligature is passed up the bowel on the forefinger of the left hand, and is easily attached to the guide which has been previously introduced to receive the ligature. The guide is then withdrawn, and the ligature passes from within the bowel out through the external opening in the buttock. The ends are now threaded through a soft silver ring. One end is taken in each hand, and the ligature is gradually stretched till the greatest tension that it will stand is obtained. Then the ring is closed with a strong forceps, the ends are clipped, a piece of absorbent cotton is placed between the buttocks, and the work is done.

An opium or cocaine suppository, if frequently introduced, will quiet any undue stinging sensation that an over-sensitive person may experience.

The time that is required for the ligature to cut through depends upon the time that the fistula has existed, the thickness of the tissue through which it has to pass, and the amount of tension which the operator is able to obtain; for the finer the rubber can be drawn the greater is the pressure obtained, and the quicker does the ligature cut.

Three days are quite sufficient for the ligature to cut through in some cases, while others require longer time.

In the use of the elastic ligature care must be taken to have it so placed that it will cut at right angles to the muscular fibres, and to the folds of the anus. The ligature must be stretched to its greatest tension; this will ensure rapid work, and it will be less painful than it will be if it is only partially stretched.

As the ligature contracts the pain lessens, and this encouragement can be held out to patients, that each day, even if there is considerable pain, is one day nearer the end of the trouble.

The treatment by the ligature is not a painless operation, but has these advantages: 1. It does not confine the patient to the bed. 2. It is attended by no loss of blood. 3. It will safely cut through dense tissues where the knife would seriously impair the health of the patient, especially if he were suffering with a bronchial affection. 4. The tissues heal as the ligature advances through them. The results obtained commend this treatment to the careful consideration of physicians, who by its judicious employment may mitigate the sufferings of those whose lives are made miserable by rectal fistulæ.

THE NATIONAL FORMULARY—AND SOME OF ITS ODDITIES, WHICH ARE EASILY OVERLOOKED.

BY LUTHER F. STEVENS.

There is small need now of speaking about reasons which forced the pharmacists into preparing a work of this character; it grew from a nucleus prepared several years since for local use, and when finally taken in hand by the American Pharmaceutical Association, a competent committee was appointed to extend and enlarge and bring it to national scope.

Aids to this committee were appointed from each State association, and by many county and local societies; much help was volunteered by physicians and others throughout the country, and a working section, composed of over twenty men, met once every week at the College of Pharmacy, in the City of New York, for a period extending beyond two years. Every formula and process which appears within this book spoken of has been carefully tried by several different trained workers (in order to eliminate personal idiosyncrasy), and the result shown before the full working board for criticism, test as against others, and revision if found necessary.

The German pharmacopœia has been considerably called upon, owing to existing necessity in portions, and many of them in this country, and for similar reason there are many from the British and also some from our own U. S. edition of 1870 which still cling in use, for which we might recall glycerite of tannin, dropped from the 1880 edition, although often called for, have been given a life.

Many ancient formulæ have been revised to meet modern ideas, dropping impractical rubbish and impedimenta, for which we might use "Warburg" as an illustration. *

Quite prominent is a fine syllabus for fluid extracts, from which, upon a little study, almost any extractable plant may be worked, and a similar general method is followed for pills and powders.

Artificial and effervescent salts are given a place, some under a significant chemical title and others in the division headed "*Sal.*" A few oleates are offered, aconitine and quinine by admixture, and a sample of process for *tvo*, lead and zinc, after the plan of Dr. Shoemaker, from which others may be schemed if so desired.

About forty formulæ are given under the heading of *Liquors*, which are well worth looking over; there are those which are old and well tried, while some appear in modern dress, and still others are entirely new and arranged to meet impending needs.

No. 221, from an eminent English M.D., will be found a fine antiseptic throat spray.

The original process is given for "acid phosphates." A handy method for Fehling's solution is shown, so that your pet druggist may always have a solution ready for you; it is from the method followed in Bellevue Hospital.

All titles are Latinized, mainly for the purpose of avoiding proprietary names and absurd kitchen terms. We do not care to have a title "Bodel's solution," for instance, so it is labeled liquor sodii boratis comp.; but a most complete index enables anything to be readily found, and synonyms are plentiful.

By reason of this method of naming thus explained, a formula for a product to replace the thousand-and-one imitations of a foreign patent medicine, known for many years as chlorodyne, appears under the head of *Misture*. Something designed for the same purpose came in the British Pharmacopœia arrangement as "Tincture."

Any one who has endeavored to collate even a few of the many published substitutes offered in medical and pharmaceutical literature for this, will have found that no two are alike, that the best of authorities are wide apart, while an analysis of a bottle of the imported compound would appear as different from the various receipts and published analyses as it is possible for the mind to think, and the reason for all this lies in the fact that in medical literature scissor work bears as large a proportion above actual trial and analysis as in any other form of popular printing.

Therefore, this committee appointed by a great society decided to take the bull by the horns, and offer a scientific, modernly-built emulsion meeting the demands of the therapist and still quite easily made. Samples now kept three years are as homogeneous as at first and easily miscible. Instead of morphine a preparation of opium is used, which may always be obtained of definite assayed strength, and thus no acid is needed to form solution. The emulsification is also much better carried out than either in the original or any of the offered supplies similar, and besides the prescriber sees and knows from the formula exactly what he is giving, no guess-work is needed. Before this formula was published it was offered for extensive private trial by physicians scattered throughout this country, and all reports were satisfactory.

The *Misture* run up to twenty-four, and are not to be despised as a list. If you should want fifteen grains each of chloral and bromide of potas., one-eighth grain each of extract cannabis indica and hyoscyamus, in a teaspoonful of liquid, is it not better to be able to see for yourself that you *can get* that without trouble, rather than depend upon a vague half-page circular advertisement dimly dwelling upon hinted concentrations of the shot-gun variety, unknown to chemistry, and not to be found when searched for?

Pepsins and allied matters have been carefully studied and worked out, although less than three pages are used in descriptions of methods and tests, yet already the plans offered are being adopted as *standard* by the most careful workers of the land.

Satisfactory and ready emulsions and flavors are given for exhibiting cod-liver oil and other distressing necessities of similar ilk, and so arranged, too, as to be easily and readily done in manner far superior and much fresher to factory products of a line of medicaments which by right should be made as near to the time of taking as possible.

The field of elixirs is covered for apparent present needs, and each formula has been carefully thought out and well tested. *A Basic Series* is first offered for the use of the profession as may be needed in every-day work, to mask as far as possible many nauseous drugs. Three simples for things not very unpleasant—elixir aromatic, elixir anise, elixir curacao. There are five more, each containing some licorice, adjuvans, especially for salines.

Glycyrrhiza, some think it good for quinine.

Glycyrrhiza aromatic, for resinous mixtures.

Taraxacum compound, a general mild adjuvant, very useful.

Eriodictyi aromatic (yerba santa) containing yerba santa (minus the bitter resin) in combination with elixir taraxacum compound. This was particularly studied out by this committee as an available mask for quinine, of which it will cover more than any vehicle yet known, but *no acid* or other diluent must be used. Besides this, among syrups, is offered a thicker preparation of different flavor where the yerba is saponified by an alkali.

Of the eight foundation elixirs, especial care has been taken to keep the alcoholic strength as low as possible, but one contains more than 25 per cent. aromatic, tarax. comp. but 10 per cent., and the yerba santa but 9 per cent.

Many of the regular list have no more than 10 per cent., instance elixir cinchona from the yellow bark, a few containing resinous fluid extracts and also rhubarb have 28 to 30 per cent., and *one* has plus 40 per cent., which is still not as strong of spirit as officinal paretoric.

Any of these formulæ, when carried out as stated, is sure in the strength given, and also the taste as much mitigated as possible.

Kumyss has a show, so that it may be made according to demand. Nitro-glycerine in medicinal solution and pills, with extensive directions for handling and keeping with safety. No other authority yet extant has brought this wonderful medicament into shape for convenience, safety, and reliability as has this little hand-book.

Accurate formulæ for manipulating the various preparations of hypophosphites appear, so that no prescriber ordering N. F. may fail of getting good and well made goods in that line.

Of course there are some matters especially designed for the benefit of the dispenser; lotions and liniments not officinal, but often called for, many formulæ to prepare specific ingredients intended for other stated articles in the work. A line of battery fluids, tents, cottons, collodions, ointments, deodorized iodoform and other surgical and toilet miscellany demanded to a greater or less extent according to locality.

Matters appear to please Brooklyn and New York, also for the far South, others for Chicago, whose committee worked very hard. And, meanwhile, no criticism from public or private sources which reached the committee but had full hearing, and if samples were offered were always placed in the most conspicuous place and received as fair trial as any. Many a formula went to pieces before that committee, and its membership suffered as much as others, if indeed not more, from seeing pet methods set aside, because in some cases newer developments gave trials which furnished better results.



THE FIFTEEN MEDICAL CLUB OF BEDFORD HEIGHTS.

Some of the physicians residing in the neighborhood of Bedford Heights have formed a local medical society, the principal object of which is the promotion of sociability among its members.

Their membership is limited to fifteen, who meet on the second Monday evening of each month, at the members' houses in alphabetical rotation, partake of a collation provided by the host, and spend the evening in an informal manner.

Their only permanent officer is the secretary, Dr. Henry B. Reed, No. 12 Verona Place; the presiding officer at each meeting being the host of the preceding meeting.

They call themselves the "Fifteen Medical Club of Bedford Heights."

The November meeting was held at the residence of Dr. S. H. Benton, 1257 Fulton Avenue. The next meeting will be held at the residence of Dr. H. D. Bliss, 23 Halsey Street.

THE BROOKLYN MEDICAL JOURNAL.

Communications in reference to Advertisements or Subscriptions (Subscription Price \$2.00 per annum) should be addressed, Business Manager, BROOKLYN MEDICAL JOURNAL, 214 Madison Street, Brooklyn, N. Y.

Remittances should be made by money-order, draft, or registered letter, payable to BROOKLYN MEDICAL JOURNAL, and addressed to Business Manager.

Authors desiring Reprints of their papers should communicate with the Business Manager as soon as the papers have been read, stating the number of Reprints desired, and the number of JOURNAL pages their papers will occupy, allowing 470 words to a page.

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All other Communications, Articles for Publication, Books for Review, and Exchanges should be addressed BROOKLYN MEDICAL JOURNAL, 356 Bridge Street, Brooklyn, N. Y.

EDITORIAL.

THE CENTENARY OF JOHN HOWARD.

On the 20th of January, 1790, John Howard died at Cherson, a village in southern Russia, near the Crimea. It is a revelation to any familiar with the present state of prison science to look behind the veil that hides the barbarity, indecency, filth and suffering that were the common lot of prison life in England and America at the end of the eighteenth century. To call Howard a philanthropist is merely to put him alongside of an army of people who have loved their fellow-men. It is vastly another thing to follow the course of that man, of austere habits of personal living, through seventeen years of untiring investigation into the conduct of prisons, not of England alone, but of every country in Europe; scrutinizing the intimate details of the shocking outrages that existed, traveling at his own expense, publishing at his own cost, first, "A General View of Distress in Prisons," and following this by numerous papers, appeals, petitions and volumes addressed to the English people and to Parliament, and living to see the reform he proposed started, himself known personally to every official in Europe, and an accepted guest at every European court.

The cruel suffering of English prison life, a hundred years since, is hardly a familiar fact even to those who are most active in schemes of modern benevolence, and it is mortifying to American pride to be compelled to accept McMasters' statements of prison life in America 1784, as portrayed in his "History of the People of the United States." He writes:

"The misery of the unfortunate creatures cooped up in the cells, even of the humanely kept prison, surpasses in horror anything ever recorded in fiction. No attendance was furnished for the sick. No clothes were distributed to the naked. Such a thing as a bed was rarely seen, and this soon became so foul with insects that the owner dispensed with it gladly. Many of the inmates of the prisons passed years without so much as washing themselves. Their hair grew long. Their bodies were covered with scabs and lice, and emitted a horrible stench. Their clothing rotted from their backs and exposed their bodies tormented with all manner of skin diseases and a yellow flesh cracking open with filth. The death-rate often stood as high as 60 in the 100." (Vol. I., pp. 96 to 102.)

And this in New England! It is not to be doubted that the time was ripe for his work, that the people in England, as in America, were becoming less the subjects, than the source, of authority. Still John Howard stands prominently out as the apostle of the reformation from "the brutal scenes on which our ancestors looked with indifference."

But John Howard is a solitary figure, bold and inspiring, in the selfish life that preceded the development of sanitary science. "No lesson ought to be more forcibly impressed on mankind, than that uncontrolled power in one or few, notwithstanding it may occasionally be exercised in splendid and even beneficent designs, is on the whole absolutely inconsistent with the happiness of a people." So wrote Dr. John Aikin, Howard's biographer, in 1792. The existence of widely separated classes, nobles, serfs, affluence and poverty, is not helpful in the direction of the common weal. When Howard told the Empress of Austro-Hungary to see the prisons for herself, she ran from him in horror at the thought. He hurled at her, retreating down the staircase, that she was a woman and would have to lie in a narrow house like her poor sisters. But Howard, the commoner, investigated the gaol fever, a "disease which has in a peculiar manner infested the prisons of this country," and found the means of stamping it out. He heard of the Plague in southern Europe, visited and lived in lazarettos and hospitals, where the disease was virulent, embarked as a passenger on a plague-stricken ship to study the disease, and actually died of the contagion, having contracted it, after having traveled fifteen miles to see a stricken daughter of the garrison, who had begged that he might visit her in her extremity. St. Paul's is his Walhalla, and part of the inscription on Bacon's full-length marble statue of the philanthropist perpetuates the fact that he died

A VICTIM TO THE PERILOUS AND BENEVOLENT ATTEMPT
TO ASCERTAIN THE CAUSE OF AND FIND AN EFFICACIOUS REMEDY
FOR THE PLAGUE.

He had the physician's instinct of duty. "Being in the way of duty," said he, "I fear no evil."

Following in close order after Howard's contributions to the study of the plague came those parliamentary regulations of quarantine and sanitary order, which ended in the establishment of the office of Registrar-General, whose statistics lie at the foundations of our present sanitary science. Again, the tide of national and social order has set in the direction of the protection of the weaker elements of the community, when Howard embarked on his journey of reform, still, his was judicious piloting and the world is the better for the discoveries he made.

Mr. Kennan, in the pages of the *Century*, has drawn public attention to the miseries and inhumanity of Siberian exile life, and though he has not allowed his pictures to suffer from want of color, it is within bounds to say that nothing that he has said of the conditions of Russian prison-life equals in enormity the stories told by Howard of England and by McMasters of America a century ago. The coincidence is rather striking that the Fourth International Prison Congress is to meet at St. Petersburg on the centennial anniversary of Howard's death; and the Russian Government, to do honor to his memory, has offered a prize of 2,000 francs and a gold medal for the best essay on "The Part taken by John Howard in the History of Prison Reform." It may be that Russia is cutting the tail from the Kennan kite, or it may be that Kennan has drawn the sting from Russia's tail. There is a certain irony in this, however, which may herald the passing of events. The proposed essay should lead to another and equally interesting study of the relation of Howard and his epoch to the development of legislation in the interest of Public Health.

•
"The spirits of the good, who bend from high
Wide o'er these earthly scenes their partial eye,
When first array'd in VIRTUE's purest robe,
They saw her HOWARD traversing the globe;
Saw round his brows her fan-like glory blaze
In arrowy circles of unwearied rays;
Mistook a mortal for an angel-guest,
And ask'd what seraph-foot the earth imprest.
—Onward he moves!—Disease and death retire,
And murmuring demons hate him, and admire."

(From the *Botanic Garden*, by Dr. Darwin, 1789.)

PROGRESS IN MEDICINE.

The editors of the Journal take great pleasure in announcing that they are able to continue the plan which they adopted at the beginning of the Journal, in publishing abstracts from current medical literature, prepared by experts in their respective departments. In the list of those who have kindly volunteered their services for the coming year in furnishing these valuable contributions, will be found the names of those who have during the two years' existence of the Journal so ably conducted their departments, and in addition other names which will at once be recognized as those of men specially competent to select material which is of true worth and merit, to the exclusion of that which is but ephemeral. These abstracts will hereafter be as condensed as is consistent with completeness and accuracy, and will appear monthly.

SURGERY.

George R. Fowler, M.D., Surgeon to St. Mary's Hospital and to the Methodist Episcopal Hospital, Brooklyn.

OBSTETRICS.

Charles Jewett, A.M., M.D., Professor of Obstetrics and Diseases of Children, and Visiting Obstetrician, Long Island College Hospital; Physician-in-Chief of the Department of Diseases of Children, St. Mary's Hospital, Brooklyn.

PRACTICE OF MEDICINE.

Henry Conkling, M.D., Pathologist and Assistant Visiting Physician to St. Peter's Hospital, Brooklyn; Physician to the Department of the Chest, Brooklyn City Dispensary.

PREVENTIVE MEDICINE.

Elias H. Bartley, M.D., Professor of Chemistry and Toxicology, and Lecturer on Diseases of Children, Long Island College Hospital, Brooklyn.

PATHOLOGY.

Joshua M. Van Cott, Jr., M.D., Pathologist and Lecturer on Histology and Pathological Anatomy, Long Island College Hospital; Associate Director of the Department of Histology and Pathology, Hoagland Laboratory, Brooklyn; Pathologist to the Brooklyn Throat and Nose Hospital.

OPHTHALMOLOGY.

Richmond Lennox, M.D., Assistant Surgeon, Brooklyn Eye and Ear Hospital; Curator and Microscopist, New York Eye and Ear Infirmary.

DISEASES OF THROAT AND NOSE.

William F. Dudley, M.D., Attending Physician, Department of Throat and Nose, Dispensary of L. I. C. Hospital; Assistant Physician, Brooklyn Throat and Nose Hospital.

CHILDREN AND THEIR DISEASES.

Jerome Walker, M.D.

GYNÆCOLOGY.

A. H. Buckmaster, M.D., Gynæcologist to the Hospital for Mental and Nervous Diseases; Assistant Surgeon to St. Peter's Hospital, Brooklyn.

DISEASES OF THE SKIN.

Samuel Sherwell, M.D., Clinical Professor of Dermatology, Long Island College Hospital; Attending Physician, Brooklyn Hospital; Surgeon to Skin and Throat Department, Brooklyn Eye and Ear Hospital.

BACTERIOLOGY.

B. Meade Bolton, M.D., Director of the Department of Bacteriology, Hoagland Laboratory, Brooklyn.

PHYSIOLOGY AND EXPERIMENTAL THERAPEUTICS.

George T. Kemp, Ph.D., Associate Director of the Department of Physiology and Experimental Therapeutics, Hoagland Laboratory, Brooklyn.



THE AMERICAN PUBLIC HEALTH ASSOCIATION.



This Association, as announced, held its seventeenth annual meeting in Brooklyn during the week October 22-25. The papers read were varied in topic and replete with information and suggestion. The public meeting held at the Academy of Music was well attended by the citizens of Brooklyn, and the addresses of Mayor Chapin, Dr. Alex. Hutchins, Rev. R. S. Storrs, and Seth Low, Esq., on behalf of the city, and that of the president, Dr. Hosmer A. Johnson, of Chicago, were well received. The members of the Association enjoyed a visit by boat to the Quarantine Station and the Hospital Islands in the lower bay. The Association adjourned on the 25th after deciding to meet at Charleston, S. C., in 1890, and after having elected the following officers for the ensuing year: President, Dr. Henry B. Baker, Lansing, Michigan; First Vice-President, Dr. Frederick Montizambert, Quebec, Canada; Second Vice-President, Dr. J. H. Raymond, Brooklyn, New York; Secretary, Dr. Irving A. Watson, Concord, New Hampshire; Treasurer, Dr. J. Berrien Lindsley, Nashville, Tennessee.

The following papers were contributed by Brooklyn members: Causes and Prevention of Infant Mortality, by Jerome Walker, M.D.; The Relation of the Dwellings of the Poor to Infant Mortality, by Alfred T. White, C.E.; Notes on the Prevention of Pulmonary Consumption, by P. H. Kretzschmar, M.D. We shall publish these papers in full in the JOURNAL.

THE HEALTH EXHIBIT.

The exhibit of sanitary appliances, foods and pure chemicals, at Exhibition Hall, corner of Fulton and Pineapple Streets, under the direction of the Committee on Exhibits of the Local Committee of Arrangement, has been one of the most interesting features of the recent meeting of the American Public Health Association. The suggestion of this exhibit is due to Dr. A. N. Bell, of Brooklyn. And, while he has been ably seconded by the members of his committee, the success of the enterprise must in justice be attributed to him. So far as we know, this is the only exhibition of the kind which has ever been held in the United States. We hope, however, that this will be but the beginning of a series of similar exhibits which will increase in value with time and experience, for the influence of such lessons of object-teaching can but be very wholesome in every community.

ST. LUKE'S HOSPITAL TRAINING SCHOOL FOR NURSES,
BETHLEHEM, PA.

The graduation exercises of this admirable training school occurred October 18, the address being delivered by Dr. A. G. Gerster, of New York.

St. Luke's Hospital is well known to many of the Brooklyn profession as one of the model hospitals of the country. Under the able management of its medical superintendent, Dr. W. L. Estes, it has reached a degree of perfection in detail and equipment not surpassed by any of our metropolitan hospitals, and physicians who have been privileged to visit it at the time of the annual graduating exercises of its trained nurses, have appreciated not only the merits of the hospital, but also the unbounded generosity and hospitality of its trustees and medical superintendent, and the admirable arrangements for safe and comfortable transportation under the personal direction of Mr. H. Stanley Goodwin, the General Superintendent of the Lehigh Valley Railroad. The address of Dr. Gerster was an excellent one, and was heartily commended by all who heard it.

OBITUARY.

ISAAC E. TAYLOR, M.D.

Dr. Isaac E. Taylor, President of Bellevue Hospital Medical College from its organization in 1861, and one of the most prominent of New York physicians, died suddenly of pericarditis on the 30th of October. Dr. Taylor was born in Philadelphia, of English parentage, April 25, 1812, and graduated from Rutgers College, New Brunswick, N. J., in 1832. In 1834 he received the degree of M.D. from the University of Pennsylvania. After a considerable stay in Paris he returned to New York, and served as physician for diseases of women at the Demilt Dispensary, a position that he retained for seven years.

In 1857 he was elected visiting physician to Bellevue Hospital. He united under one medical organization with Bellevue Hospital all the institutions on Blackwell's Island and the other East River islands. Later on he established the medical college in connection with the hospital, and became its president, as well as its first professor of obstetrics and diseases of women and children. He was one of the founders of the American Gynæcological Society and the New York State Medical Association,—of the latter he was the first president chosen from New York City.

He leaves four children,—Col. Stuart Taylor, of California; Mrs. Pierre Lorillard, Mrs. Hilliard Judge, and an unmarried daughter.

LOUIS NICOT.

The medical profession of Brooklyn sympathize with their pharmaceutical brethren in the loss of Louis Nicot, who was a moving spirit in the adoption of our pharmacy laws and the organization and work of the Board of Pharmacy, of which he was a member from its beginning.

For six years he was its efficient secretary, frequently visiting each pharmacy in the county, elucidating the new, and at that time more or less unpopular law, and enforcing its obedience, and at the time of his death (November 1) was the president of the board.

He was also one of the organizers of the Kings County Pharmaceutical Society, for several years its president, and always one of its most active members, constantly striving to elevate the standard of the profession.

He was an active politician, and it was probably his enthusiasm in that direction which cost us his life, having taken cold from exposure to the storm during the inaugural ceremonies of President Harrison. Pulmonary phthisis is said to have caused his death.

PROCEEDINGS OF SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

The regular meeting of the Medical Society of the County of Kings was held at the Society's rooms, 356 Bridge Street, Tuesday evening, October 15, at 8 o'clock, the President, Dr. Matheson in the chair.

There were about one hundred members present.

The minutes of the previous meeting were read and approved.

The Council reported favorably upon the applications of Drs. Lewis P. Grover, Clarence Thwing, F. P. Keyes, Lemuel G. Baldwin and F. W. Fleischhauer, and recommended that they be elected to membership.

The council further recommended that the By-Laws be suspended to the extent of permitting any one who had been elected to membership during the year, but who had neglected to complete his membership, a further opportunity to do so.

On motion, duly seconded, the above report was accepted and adopted as read.

The following named physicians were proposed for membership :

Robert Hunter Duncan, 173 Hancock Street, College of Physicians and Surgeons, Baltimore, Md., 1885 (endorsed by L. I. C. H.); proposed by Dr. William Maddren, Dr. D. F. Lucas.

B. Meade Bolton, Hoagland Laboratory, University of Virginia; proposed by Dr. J. H. Raymond, Wm. Hutchinson.

William Jarvie Turner, 105 Clinton Street, L. I. C. H., 1886; proposed by Dr. Benjamin Edson, J. H. Raymond.

Lawrence Coffin, 63 Central Place, E. D., L. I. C. H., 1889; proposed by Dr. Charles Jewett, Ernest Palmer, M.D.

J. C. Fitzsimmons, 453 Gold St., L. I. C. H., 1887; proposed by Dr. E. H. Bartley, Dr. W. M. Hutchinson.

Henry R. Price, 485 Franklin Avenue, University of Penn., 1880; proposed by Dr. Henry B. Read, Dr. A. R. Matheson.

George B. O'Sullivan, 126 William Street, L. I. C. H., 1887; proposed by Dr. John Harrigan, Dr. W. M. Hutchinson.

J. E. Walsh, 17th Street, Bellevue Hospital, 1886; proposed by Dr. John Harrigan, Dr. W. M. Hutchinson.

The following having been proposed, and favorably reported upon by the Council, were elected to membership :

Drs. William S. Applegate, Madeline Marquette, L. A. W. Alleman, and J. H. Marshall.

The first paper of the evening entitled, "A New Curette for Curetting the Male Bladder," by George G. Hopkins, M.D., was then read.

The report of the Committee on Surgery was then read as follows:
Anatomical Landmarks and Operative Technique of Strangulated Hernia, by E. A. Lewis, M.D.

Some Points on the Reduction of Hernia, by Jarvis S. Wight, M.D.

The Question of the Radical Cure of Hernia from its Present Aspect. By George R. Fowler, M.D.

MISCELLANEOUS BUSINESS.

The Chairman stated that the American Public Health Association would hold its annual meeting in Brooklyn during the coming week, and that the Society had been requested to contribute fifty dollars toward the necessary fund for defraying the expenses of the convention.

On motion, duly seconded, the Council were authorized to appropriate this sum for the above purpose.

There being no further business, on motion, the meeting adjourned.

W. M. HUTCHINSON, *Secretary*.

MEDICAL SOCIETY OF THE COUNTY OF KINGS.

SUBJECTS FOR DECEMBER MEETING (DEC. 16).

Report of Committee on Obstetrics.

Puerperal Wound Infection, by Charles Jewett, M.D.

Note on Immediate Repair of the Cervix after Labor, by Robert L. Dickinson, M.D.

Separation of the Symphysis Pubis, with a case, by George McNaughton, M.D.

Diphtheria, by J. G. Johnson, M.D.

BROOKLYN MEDICAL MICROSCOPICAL SOCIETY.

The twenty-seventh regular meeting of the Society was held at the Hoagland Laboratory on November 6, 1889, the President, Dr. Heitzmann, occupying the chair. After the transaction of the regular business, during which Dr. L. E. Tieste, of Brooklyn, was proposed for active membership, an interesting demonstration of psorosperm, the anthrax bacillus, and the micrococcus tetragonus was made by Dr. Van Cott. This called forth an active discussion by Drs. Wilson, Weeks, Heitzmann and Van Cott, in which the value of tetragonus as a factor in the diagnosis of developing lung cavities was maintained.

The Society adjourned at 10 P. M.

By order of the Committee.

RICHMOND LENNOX, *Secretary*.

PROGRESS IN MEDICINE.

SURGERY.

BY GEORGE R. FOWLER, M.D.,

Surgeon to St. Mary's Hospital and the Methodist Episcopal Hospital.

UPON THE TREATMENT OF TELANGIECTASIS.

Von Mosetig-Moorhof (*Wiener med. Wochenschrift*, 1889, No. 1). M. recommends the styptic qualities of hydrogen peroxide (H_2O_2) in the treatment of nævus. In a child eight days old, almost the entire right thigh was found to be the site of a telangiectasis, covered by a thin and bluish-red skin. In the course of the following five months, injections of five grammes each of hydrogen peroxide were used, at different points of the growth. Considerable swelling followed each injection, which soon disappeared; otherwise no disturbances were visible. At the end of that time the tumor had disappeared; the circumference of each thigh was the same. [No mention is made of change in color, and for this reason, the applicability of the method to exposed portions of the body, where the cosmetic effect is of great importance, is not determined by these observations.] The method may be used as preliminary to excision, thereby lessening the dangers of the latter from hæmorrhage, should the area remaining prove to be of an objectionable hue.

LUXATION OF THE HEAD OF THE HUMERUS BACKWARD.

Baum, of Dantzic (*Centralblatt f. Chirurgie*, 1889, No. 4). B., reasoning from the fact that Schinzingers's method of reduction of recent subcoracoid dislocations by means of abduction and rotation of the arm outward is the least painful and most easily accomplished, used in luxation of the head of the humerus backward, a reverse method, this consisting of strong abduction followed by inward rotation. In three cases, all old women, this procedure was accomplished without the aid of anæsthesia, and without the patient's realizing that anything had been done for the reduction of the displaced bone.

UPON THE CLINICAL DIAGNOSIS OF INTESTINAL OBSTRUCTION.

Prof. Ed. v. Wahl, Dorpat (*Centralblatt f. Chirurgie*, No. 9, 1889). W. calls attention to the fact that in certain cases of obstruction from

strangulation or volvulus there is a fixed condition and ballooning of the loop lying immediately below the point of obstruction, and that, by careful inspection and palpation of the abdomen the seat of the strangulation or volvulus can be determined. Given the classical group of symptoms of ileus, he considers it possible to make the operation one directed to the relief of the obstruction at once; and in cases where the subjective symptoms are not distinctive, this fixed condition of a portion of the bowel and the distension accompanying it are at once suggestive, not only of one of the forms of acute obstruction above alluded to, but of its site.

The same author (*Archives f. klinische Chirurgie*, Bd. 38, p. 233) records three cases in which the diagnosis was clearly established by attention to the points above alluded to, as proven by the subsequent laparotomy undertaken for the relief of the obstruction.

THE THERAPEUTIC IMPORTANCE OF NERVE STRETCHING.

M. A. Wassiljew (*Chirurgischeski wetsnik*, 1888, Sep.-Oct.). *Centralblatt f. Chirurgie*, No. 14, 1889, p. 247. The author, in a series of experiments upon rabbits, determined that the motor excitability of the nerves subjected to the stretching process was in all cases lessened, while that of the corresponding nerve upon the opposite side was increased. After from one to three months, in three cases, the motor excitability of the nerves operated upon was restored and even increased, as compared with the condition existing before the operation; in one case simple restoration occurred, and in a fifth case the original condition was not quite reached. In the nerves of the opposite side, corresponding to those operated upon, the increased motor irritability persisted for a time, but finally lessened; but in every case it remained greater than before the operation. Microscopic examination of sections of the spinal cord gave quite negative results; the latter is contrary to the results of the experiments of Madam Tarnowskaja, this experimenter employing great force in stretching the nerves, however.

W. operated upon three cases by means of nerve stretching. In the first case the patient had fallen from a considerable height. Various contusions were found, but the patient could manage to walk. One month later epileptic seizures occurred, preceded by pains and jerking in the left leg, which were followed by similar occurrences in the opposite side, pain in the epigastrium, loss of consciousness and convulsive movements, lasting for five minutes or more, and ending in a deep sleep. A painful spot was found to exist in the course of the sciatic nerve, which, upon being grasped tightly when an attack threatened, sometimes resulted in aborting the latter. The left sciatic nerve was stretched, and the attacks ceased at once. Although under

observation for one and a half years, no recurrence took place. In a second case, facial paralysis of rheumatic origin was decidedly benefited by stretching the nerves. In a third case, also one of facial paralysis, the result, however, of a knife wound behind the ear, as might have been expected, no improvement followed the operation of nerve stretching.

ARTIFICIAL INCREASE OF BONY GROWTH IN MAN.

Schuller (Berliner klin. Wochenschrift, 1889, Nos. 2 and 3). The longitudinal growth of bone under certain conditions (necrosis and other chronic inflammatory processes of bony tissue) as observed by v. Bergmann, v. Langenbeck, Ollier, Dittel, Weinlechner and Schott, Poncet, Howard Marsh, Tillmanns, Helferich, and others, led to further observation upon this point, with the result of developing the fact, (Ollier) that moderate irritation of the diaphysis of the bone led to increase in its development; on the other hand, any interference with the epiphyseal cartilage leads to arrest of the growth of the bone. These latter have been frequently corroborated by later observers, and may now be deemed as established facts. S. shows that the determining cause, the fact as to whether there shall be lengthening or shortening of the limb depends not so much as to whether the irritation is applied at a greater or lesser distance from the line of the epiphysis, but upon the degree and extent of the irritation itself.

Different measures have been advocated to accomplish this purpose. Among these, irritation of the periosteum produced by driving into the bone ivory pins (Ollier, v. Langenbeck, etc.), and firmly constricting the limb by means of an elastic tubing (Helferich) seem to have found the greatest favor. S. employed the latter, conjoined with massage, gymnastics, a special diet and bathing, particularly sea bathing. In addition to these, in a few cases, the irritation was initiated by driving a nickel-plated steel pin into the one or the other of the extremities of the diaphysis of the bone to be lengthened. He relates a number of cases, illustrating the method of treatment, and seems to have met with a uniform success in the use of the method.

THE IODOFORM-ETHER TREATMENT OF TUBERCULOUS INFLAMMATION OF BONE.

J. Dallinger, of Budapest (Centralblatt f. Chirurgie, No. 20, 1888).

Verneuil makes the following remark in the course of an article upon this subject:¹ "As a further advantage—this agent possesses no toxic qualities."

¹ Injections d'éther iodoformé dans les abcès froids. *Revue de Chirurgie*, 1885, p. 428.

Verneuil's colleagues do not seem to fully agree with him in this latter respect, for upon at least two subsequent occasions the discussion upon this subject elicited expressions of opinion tending to show that the truth of the statement above quoted is more than likely to be refuted.² Dallinger relates his own experiences, based upon an extensive use of the agent, and relates three illustrative cases, showing the dangerous symptoms which may follow its use. D. uses the method only in the most severe cases, such as psoas abscess, or suppurating morbus coxarius, and not in those cases of tuberculous inflammatory conditions met with so frequently, in which the ulcerative process is quite frequently repaired through the inherent vitality and resistance exercised by the tissues themselves. In addition to pointing out the dangers of iodoform-ether injections into tuberculous abscesses, D. emphatically denies that any advantage is to be derived from this treatment in typically severe cases.

ELECTRICAL CATAPHORESIS.

Ad. Barth (*Centralblatt f. Chirurgie*, No. 22, 1889). B. calls attention to the uselessness of the application of cocaine by the usual methods of pencilling in solution, except in situations where the epidermis has been removed, or upon mucous membranes. He recommends Wagner's method of electrical cataphoresis in the production of local anæsthesia, this consisting of placing a pad of cotton, moistened with a ten per cent. solution of cocaine, over the part to be operated upon and applying to this the positive pole of the galvanic battery. In from fifteen to twenty minutes, with the negative pole upon the back of the neck, anæsthesia sufficient for the performance of small surgical procedures, such as a Wilde's incision, or incision of the membrana tympani, is obtained. Four to ten cells are required.

PRACTICE OF MEDICINE.

BY HENRY CONKLING, M. D.,

Pathologist and Assistant Visiting Physician to St. Peter's Hospital; Physician to the Department of Chest, Brooklyn City Dispensary.

PULMONARY TUBERCULOSIS.

PHYSICAL SIGNS OF PULMONARY CAVITIES.

Maguire (*Clin. Lecture, Brompton Hosp., London, June 12, 1889; Personal Report*) spoke of certain conditions that might be found in cases of pulmonary cavities. From these remarks are taken certain observations relating to the percussion-note.

² Séance de la soc. de chi., Jan., 1887; June, 1888.

There are three modifications of the percussion-note typical of pulmonary cavities:

1. *Weinbruch's Modification*.—Percussing during either act of respiration with the mouth open gives a higher pitch than when the mouth is closed. When the mouth is open, we have three cavities—nostrils, mouth, and pulmonary cavity—and the vibrations produced in this continuous tube are of different quality from those produced where the exit of the air is shut off by one or more being closed. The bronchus must have free communication with the cavity.

2. *Friedreich's Modification*.—In inspiration the note is higher than in expiration. During inspiration the chest-walls are acted upon by muscles which cause a certain amount of tension, and so raise the note.

3. *Gerhard's Modification*.—The percussion-note is higher when upright than when lying down. The cavity must contain a certain amount of fluid. When upright, the long axis of the cavity is parallel with long axis of the body. There exists a long column of air which is set in vibration. When lying down, the relation of the axis of the cavity to that of the body is changed, and there exists merely a short column of air, the vibrations of which differ from the first. The fluid in these conditions gravitates to bottom of cavity. When upright, it occupies a small space; but when lying down, it covers, necessarily, a larger area, and produces a column of air having width, but not length.

DIFFUSION OF TUBERCLE BACILLUS OUTSIDE THE BODY.

Cornet (Centralbl. f. Bacteriologie, 1889) writes of certain experiments made upon animals with the dust from the walls of the rooms occupied by tubercular patients. With this dust, in sterilized broth, he injected the peritoneal cavities of healthy animals. All of these animals died, in course of time, with typical bacillary tuberculosis. The dust used was obtained from the walls of hospital wards and from the walls of rooms in private houses. From these observations the author has drawn certain conclusions relative to the propagation of tuberculosis. He believes that the tuberculous patient is not a source of danger as long as his sputum is, in one way or another, destroyed and his living-room disinfected.

The virulence of the dust remains for some time after the removal of the patient from the room. It is possible that when several cases of tubercular disease occur in one family, the later cases may come from infection from the dust of the living- and sleeping-rooms. The bacilli in the dust come from the dried and powdered sputum, as from spitting into a handkerchief or using spittoons containing sand or saw-

dust. The author believes that all expectoration should be received in vessels, and not allowed to dry. He also emphasizes the statement that direct or indirect contact with the mouth of phthisical patients should be avoided.

For the protection of the family, many important rules are given, some of which can hardly be carried out in private work, but their importance is nevertheless very evident :

1. A phthisical mother should not nurse a child at the breast.
2. Care should be taken, in selecting wet-nurses, that there may be no trace of tubercular disease.
3. The milk should be free from all taint.
4. The kissing of children by strange people and the licking of dogs should be forbidden.
5. Walls should be cleaned.
6. Floors should be washed, not swept.
7. All beds, bedding, and linen should be disinfected.
8. The importance of special hospitals.
9. State regulations to limit bovine tuberculosis.

NEW ANTISEPTICS IN PHTHISIS.

Williams, C. Theo. (*Lond. Prac.*, Feb., 1889), gives an interesting account of the line of treatment followed in thirty-nine cases, taken from his wards at Brompton Hospital. Two remedies were experimented with. During the period over which the experiments extended the patients received no other treatment.

I. Phenyl-propionic acid ($C_9H_{10}O_2$). This is a derivative of coal-tar, and consists of acicular crystals of reddish color, insoluble in water; dissolved in spirit, giving a feeble acid reaction. A saturated alcoholic solution was made. The taste, when diluted, is pleasantly acid. There is a decided aroma. The dose used was ten minims of the solution in one ounce of water, and was increased to twenty minims in two ounces of water.

Twenty patients were selected. Six of these were males and fourteen females. The ages ran from twenty-five to forty-five years. In all the disease was progressive in its nature. Nine of the cases were of early tuberculosis—tuberculization of one lung. Three cases had both lungs affected. Eight cases were marked by the presence of a cavity in one lung and tuberculization of the upper lobe in the opposite lung. Eleven cases in all presented cavities.

The treatment continued from twenty-eight to eighty-five days, or an average of forty-six days. In only one case was there any stomachic irritation. This was obviated by increasing the water to two ounces.

The odor of the drug could not be detected in any of the excretions. Of these cases thirteen improved, four remained stationary, and three became worse. The improvement consisted in gain of weight and strength with better color. The cavity cases seemed to improve more than the others. In only five cases was there local improvement. There was no diminution in expectoration or cough. The drug did not influence the pyrexia.

II. Phenyl-acetic acid (C_8H_8O) belongs to the same series as the above, but has a more acid reaction. In using this the same dose was employed. The cases were nineteen in number, fourteen males and five females. The average age was twenty-five years. Seven of the cases were of double disease. In ten there were cavities. The treatment lasted from twenty-one to eighty-nine days. The average was forty-five days. There were no unpleasant symptoms.

The author draws the following conclusions: That the drugs promote appetite, digestion, and assimilation; that they can be long used; that they improve more the general health than the local disease; that phenyl-propionic acid seems to act better in cavity cases, and phenyl-acetic acid in tuberculization cases. The following table is given:

	Cases.	IMPROVEMENT.	
		General.	Local.
Phenyl-propionic.....	20	65 per cent.	25 per cent.
Phenyl-acetic	19	68.4 "	63.4 "

OZONE IN THE TREATMENT OF PHTHISIS.

Ransome (Med. Chron., Lond., May, 1889) records the treatment of thirteen cases of pulmonary tuberculosis by the inhalation of ozone. Each cylinder used contained seven litres of pure oxygen ozonized up to nine per cent. No other treatment was employed. The cases represented various stages of the disease, and were all under observation for more than one year. The author says that the results obtained were a continuous freedom from fever, absence of night-sweats, diminished expectoration, and great gain in weight and strength.

The author believes that ozone does not act as a direct germicide, and that the control over the disease does not seem to come from any direct action upon the tubercle bacillus. It acts by restoring tone to diseased portions, and has a beneficial effect on the general health.

In the paper the daily notes are given of each case. One can hardly find the author's conclusions in these notes. In one case, certainly, the inhalations caused a fresh bronchitis, and emesis also occurred in others. These patients, perhaps, would have improved

quite as much if no ozone had been given, as they received good care and good food. The author offers the treatment as giving the best results as yet obtained (?).

THE INTESTINES IN TUBERCULOSIS.

Potain (L'Union Méd., 1889) describes three forms of intestinal disorders in cases of pulmonary tuberculosis. These are: simple enteritis, tubercular lesions, and nervous disorders. The clinical history of a case is this: Certain dyspeptic symptoms which, increasing in severity, finally end in diarrhœa with colic; if the colon be attacked, the motions are covered with mucus, and not mixed with it, as is the case when the disease is higher up; later comes hæmorrhage; the stools become dark and fetid; there may be severe abdominal pain; in the more unfavorable cases, tenesmus may be present, with a complication of anal abscess.

The lesions which are found, vary. There may be simple inflammatory thickening and swelling of the mucous membrane. At times the membrane is very thin. An abnormal amount of pigmentation is found in the submucosa. The lymphatic glands are enlarged and distended. The villi are wide and swollen. The tubular glands are filled with dead epithelium. By the coalescing of these glands, simple ones become converted into compound, often of great size. The closed follicles stand out prominently, and are called *psorentery*. Cicatrization always leads to narrowing of the bowel. *Bacilli are met with in follicles whose epithelial covering has been destroyed. This is evidence that enteritis must have existed before they found a nidus in the intestine.*

The cause is local inoculation.

In treating these cases, the patient must be warned against swallowing expectoration. All milk should be boiled. Pancreatine and biters are useful. Tannin, given in a two-per-cent. alcoholic solution to the amount of fifteen grains, in broken doses, gives good results. Preparations of opium must frequently be employed.

(The author believes in the local origin of the intestinal complications, and gives a caution in regard to the swallowing of the expectoration. He ignores, however, what is probably the true reason of the tubercular disease in the bowels. In over fifty per cent. of post-mortem examinations at the Brompton Hospital, laryngeal tuberculosis is found. The majority of these cases give evidence of lesions in the intestines. The lesions seldom occur except in cases where cavities are secreting. The complication of laryngitis leads to tubercular infection and additional secretion, which may easily find its way into the stomach.—H. C.)

ARTICULATE MURMURS HEARD IN PHTHISICAL CASES.

Phillip (*Brit. Med. Jour.*, May, 1889) writes of the two murmurs which are generally described in connection with tuberculosis. The first is the infra-clavicular murmur, first noted by Stokes. He mentions it as an increased action, often accompanied with a bruit de soufflet, which, when the upper lobe is diseased, may be occasionally heard in the subclavian artery. This murmur has always been regarded as due to pressure. The author objects to this theory. In the early stages of the disease, when the murmur is first heard, the amount of consolidation is too slight to produce the necessary pressure. In the later stages of the disease with large cavities, the consolidation is more or less destroyed. He thinks, however, that the murmur is produced by vibrations in the blood current, arising from defective relationship of the arterial calibre to the blood contained within it. When manipulation is made, the consolidated lung fails to expand, and the artery is, therefore, exposed in an unusual degree to the dilating force of inspiration, and, becoming insufficiently applied to the blood within it, a murmur results.

The author believes the pulmonary murmur to be due to the same cause. He records a post-mortem examination in which there was no retraction of the lung, which, of course, would have prevented any pressure on the vessel.

HIGH ALTITUDE TREATMENT OF PHTHISIS.

Tyson (*Illus. Med. News, Lond.*, Apr., 1889) offers certain considerations on the above topic from climates marked by

1. Extreme purity of the air.
2. Aerial rarefaction.
3. Low relative humidity.
4. Immunity from wind, fog, and miasmal emanations.

The cases sent to such climates should be carefully selected. No case should be sent in which there is senile change, laryngeal ulceration, gout, rheumatism, organic nerve disease, or hysteria.

When there is no marked emaciation, severe pyrexia, or kidney complication, the author finds the cases do well. An important rule is that the patient should live continually in the chosen place, and not return, even for short visits, to lower altitudes. This length of time he believes should be fully two years.

Cold, dry air is stimulating. It is detrimental to all fungus growth. The secretion from a cavity has a tendency to dry up. Its rarefaction increases the number of respirations, and has a considerable influence in permanently expanding the lungs.

Slight oozing of blood from mouth, nose and throat is common when patients first arrive. It may be that the mucous membranes near the surface of the body become dry, and there may be blood stasis, especially when the air is cold. In the lungs, however, the supply of watery fluid is so great that dryness is impossible, and, at the same time, the air is warm before it reaches the lungs. The removal of watery vapors would even relieve the congestion without bleeding.

It may be, however, that the diminished air pressure tends to draw the blood to the surface and so cause the bleeding.

The author finds that these slight hemorrhages do not harm, and that the membranes soon become accustomed to the changes in the air.

THE STOMACH IN TUBERCULOSIS.

Schelty (*Deutsche Archiv f. Klinische Med.*, 1889) writes that since the bacilli cause a destruction of the albuminous constituents of the body, a rational course of treatment will be, as far as possible, to neutralize this process. In phthisis some symptoms and signs of digestive disturbance almost invariably occur either before or with the onset of fever.

The patient may complain of pain, anorexia, nausea, pyrosis, etc., yet even in these conditions the ability of the stomach to digest food may remain. The author has tested in some twenty-five cases the digestive powers of the stomach. He has given phthysical patients the whites of hard-boiled eggs with a certain amount of water. Another meal consisted of soup, meat and bread. After a certain time the contents of the stomach were withdrawn by means of a soft tube and then tested for reaction, lactic acid, hydrochloric acid, acetic acid, and butyric acid. The cases represented all forms of the disease. From these experiments the author concludes that the capacity of the stomach for digesting albumen was not destroyed. There was no evidence of imperfect muscular power. The greatest difficulty to overcome in these cases is the repugnance to food. The experiments are very valuable in teaching that certain conditions are not always indicative of gastric catarrh, and that over-feeding is permissible in many cases and will give good results.

TUBERCULOSIS.

Whittaker (*Annual of the Union Med. S.*, 1889) gives an exhaustive history of tuberculosis from the works of many writers. -

[From this article brief selections have been made, giving the name of the original author.]

I.—THE INVASION.

By Inheritance :

In 1,000 hospital cases heredity was found in twenty-four per cent.—Williams.

In 1,000 private cases heredity was found in twelve per cent.—Williams.

In 1,200 hospital cases heredity was found in thirty per cent.—Pollock.

In 1,000 hospital cases heredity was found in thirty-six per cent.—Cotton.

A child may be born with the bacillus tuberculosis in its tissues, which may remain inactive for years.—Baumgarten.

A congenital tuberculosis has been proved in the foetus of a cow (tubercular).—Johne.

Transmission through the semen is purely hypothetical; as—

Rabbits have been inoculated with semen from consumptive patients with negative results.—Rohlf's.

A tubercular mother was permanently confined at seven and a half months. The child died three days after and the tubercular lesions were found.—Charrin.

Direct hereditary transmission is rare. It is confined to cases of affection of the testicle, ovaries, placenta, or bowel.—Whittaker.

By the Lungs :

(See above. Extract from Centralbl. f. Bacteriologie.—Cornet.

By Alimentary Canal :

Tubercular mammitis is rare in mothers. Eight cases are recorded.—Hubermaas.

Tubercular mammary glands in cattle are common.—Woodhead.

Tuberculous milk will produce intestinal tuberculosis—Gerlach.

Tubercle bacilli have been found in the milk of tubercular cows. This milk, ingested or inoculated, produced tuberculosis in animals.—Bang.

Tubercular meat (muscular fibre) is not so dangerous as milk.—Nocard.

Tuberculosis is seldom produced by inoculation —Chaveau.

Infection may come from swallowing sputum.—Mosler.

Chickens fed on tuberculous sputum (human) developed tuberculosis. —Cagny.

By the Skin :

Tubercular growths of the skin have resulted from washing the clothes of phthisical patients.—Stemthal.

By Flies:

Flies fed on tubercular sputum injected into the cornea of Guinea pigs produced tuberculosis.—Hoffman.

LIFE OF THE BACILLI.

Drying, putrefying, and freezing do not destroy the bacilli. Sputum thus treated preserved its virulence for one hundred and two days. Boiling weakens but does not kill. Sputum should be burned.—Cadéac.

The bodies of phthisical patients should be cremated.—Whittaker.

STAINING OF BACILLI.

The dry preparation is to be placed for two minutes in a solution of 15 grains of fuchsin in $3\frac{1}{4}$ ounces of a five-per-cent. solution of carbolic acid and $2\frac{1}{2}$ ounces of absolute alcohol. Then place for one minute in a solution of 30 grains of methyl blue and $3\frac{1}{4}$ ounces of sulphuric acid. Rinse in water and examine or wash in absolute alcohol and mount in compound balsam. The bacilli are red and the field blue.—Gabbet.

THE BACILLI IN DIAGNOSIS.

The tubercle bacilli are of great value in making the diagnosis of tuberculosis in certain obscure cases:

1. Where there are no physical signs.
2. Laryngeal disease without definite pulmonary signs.
3. Bronchitis with emphysema.
4. Pleural complications.
5. Very slight signs.

—Kidd and Taylor.

SENILE PHTHISIS.

This is frequently observed in patients over fifty. The disease is often never found until after death. The disease in the aged seems to run a slowly progressive course.—MacLaclan.

TREATMENT.

By High Altitude:

In an analysis of some one hundred and forty-nine cases the following results are noted:

14.13	per cent.	were cured.
29.78	"	improved greatly.
11.34	"	" somewhat.
17.02	"	became worse.
13.47	"	died.

—Williams.

By Creasote:

The following is recommended:

Creasote, 13 parts.

Tr. gentian, 30 “

Alcohol, 250 “

Tokay or Malaga wine up to 1,000 parts.

A drachm of this, well diluted, to be taken three times a day.
—Von Brun.

Injections are recommended in the form of eight minims of a three-per-cent. solution of almond oil.—Rosenbusch.

Taking it all in all, we find that creasote in large doses has no injurious effect in tuberculosis. At times we noticed an apparent favorable symptomatic effect. We failed, however, to observe any real influence excited by creasote on the part of the disease.—Strümpell.

Rectal Gas Injections:

These exert no permanent good. —Biehmel.

Aniline Inhalations:

These were tried in a series of cases without benefit.—Teslamis.

Mercury:

This is the best adapted specific in the treatment of tuberculosis.
—Martell.

Mercury is pernicious in consumption.—Cullin.

Bin-oxide of mercury in the form of a spray: One $\frac{1}{40000}$ part gave improvement in seven per cent. of cases treated, the improvement noted being alternation of the pulmonary lesion, diminished expectoration, and, in two cases, a disappearance of the bacilli.
—Ruelff.

Tannin is beneficial.—Cecchevelli.

Talc (silicate of magnesia) is useful in obstinate diarrhœa.—Deboie.

Agaricine in doses of one-twentieth grain acts well in checking the night sweats.—Piermy.

Sulphurous acid is useful in night sweats —Darris.

CORRESPONDENCE.

TREPHINING OF SPINAL COLUMN IN POTT'S DISEASE.

In Dr. Figueira's criticism, under the above heading, appearing in the *Brooklyn Medical Journal* for November, he refers to Dr. Rand as advocating rest in bed, with extension from the patient's head, as the "only means of mechanical treatment" in Pott's disease. If the remarks thus alluded to can be so construed, it is certainly time that they were more fully explained.

If the doctor will carefully read that paragraph to which he refers, he will see that it was intended to apply only to "cases like the one reported," viz., to those associated with so much paralysis that it is nearly or quite impossible for the patients to walk. Such rest and extension, together with as nearly complete fixation of the diseased spine as is possible, were advocated as the best and most rational treatment for cases of well-marked paralysis, due to pressure of the products of inflammation upon the cord, during the course of caries of the vertebræ. No reference was made to the treatment of Pott's disease prior to the occurrence of well-marked paralysis, as that was not the question at issue; nor to the treatment after such paralysis had subsided sufficiently to render it possible for the patient to get about safely, with proper mechanical aid.

Surely, no surgeon, at the present day, will confine to bed a case of Pott's disease, when the patient is able to move about by any means whatsoever, with any degree of safety and comfort! But, in my judgment, it would be unwise treatment to load down a patient with a jacket and a jury-mast, and compel him to take exercise, when he is so far paralyzed as to be practically incapable of sustaining even his own weight. And, while no one will deny the value of the plan of treatment referred to by Dr. Figueira, in so far as it pertains to the management of Pott's disease in general, yet the majority of surgeons will probably hesitate to apply it to a case that has reached that particular stage of the disease at which this one had arrived at the time an operation was undertaken.

The doctor speaks of the jury-mast as if, in his judgment, it was an all-sufficient appliance, in connection with a jacket, for the treatment of caries of the cervical vertebræ; but, while I am ready to bear witness to its value in the management of such disease of the upper dorsal

and lower cervical regions, it only imperfectly meets the indications for treatment in very many cases of caries of the middle or upper cervical vertebræ. There is a greater necessity here, than elsewhere, for fixation of that portion of the spine involved, especially when the disease has extended to the intervertebral cartilages and ligaments, and for such fixation the jury-mast in no way provides. These cases will be found to improve more rapidly, when, in addition to relieving the diseased vertebræ of their superincumbent weight, they are at the same time kept as nearly at rest as possible, so far as their relations to each other are concerned.

H. W. RAND, M.D.

MISCELLANEOUS.

CURIOSITIES OF MEDICAL LITERATURE.

We clip the following from a Brooklyn newspaper, the operation referred to having been performed in this city :

“A woman of middle age, living at No. — Avenue, has been suffering from a cancer of the upper jaw. It began five months ago from a decayed tooth. Finally Dr. —, a young man of great promise in his profession, undertook the operation for removal, assisted by other physicians. After cutting through the lip, the side of the nose, and horizontally under the eye, he found a great portion of the bone involved, including sinews running to vital points, so he boldly undertook to remove all the diseased parts; not only the exsection of the right upper jaw, and the plate on which the eye rests, the nasal and other parts of other bones forming the skull, but dug out from various openings running to vital centres. It was an operation exceedingly rare, of greatest delicacy, and extremely dangerous to life; but by the valuable assistance rendered he was able to control all hemorrhage and to rally the patient from the collapse into which she went. Now, after twenty-four hours, she has a good pulse, takes abundant nourishment, is able to talk, and bids fair for speedy recovery from the operation.”

DR. JOSEPH PARRISH.

The American Association for the Study and Cure of Inebriates gave a dinner to its President, Dr. Joseph Parrish, at his home in Burlington, N. J., on November 12, in honor of the seventy-fifth anniversary of his birth.

Brooklyn.....	18.21	Vienna.....	18.37
New York.....	19.93	Paris.....	22.18
Philadelphia.....	16.30	London.....	15.98
Berlin.....	17.68	Glasgow.....	20.02
Dublin.....			27.25

PRELIMINARY EDUCATION OF MEDICAL STUDENTS.

The Regents of the University of the State of New York have issued the following instructions for the accommodation of candidates under the law relating to examinations on the subjects preparatory to the study of medicine, as required by Chapter 468, Laws of 1889. Special examinations will be held at the times and places noted in the annexed schedule. All correspondence on this subject should be addressed to Edward I. Devlin, A.M., the commissioner in charge of such examinations, at the Regents' office, Albany, N. Y.

All candidates must notify the commissioner, by letter, at least one week in advance, stating at what place and in what studies they wish to be examined. No fee will be charged, and candidates will be informed of the result within twenty days from the close of the examination.

To insure success, the candidate should have a thorough knowledge of the whole of a standard school text-book on each of the required subjects, but cube root will not be included in the arithmetic examination.

Printed question-papers will be issued from the office of the Regents for each examination. The answers must be written in ink on legal cap paper, and arranged and numbered in the same order as the questions. Candidates should bring paper, pen, ink and blotter.

Seventy-five per cent. of correct answers is required in all subjects except orthography. In the latter study, the candidate must spell correctly eighty-five out of one hundred words, such as are commonly used in current literature.

In the examination in arithmetic the entire operation required for obtaining the result must be given, and the answer or result must be reduced to the simplest form.

The candidate must write at the top of the first page of his answer-paper (1) the place of examination, (2) the subject, (3) the date, (4) his own full name, (5) his post-office address.

At the conclusion of his answers on any subject, or at the expiration of the time allotted for such subject, the candidate must make and subscribe to the declaration given below, by writing on the lines immediately succeeding the last answer the words: *I do so declare*, and then his name. Every paper lacking this declaration and signature will be rejected. The declaration to which he thus subscribes is as follows:

Form of Declaration.

 Do you now, at the close of the examination in arithmetic (etc., as the case may be), conscientiously declare that, you had no knowledge of the questions to be proposed, that you have neither given to any other candidate nor received from any source, explanations or other aid in answering any of them, and that you have not spent more than the allowed time. If so, write in the next line after the end of your set of answers, near the right side of the paper, the words,

"I do so declare."

and underneath, *subscribe your name.*

All papers which fall below the required standard will be returned to the candidate. For those accepted, pass cards, certifying such proficiency, will be issued, and when all the subjects are completed, the certificate provided for in article 14 will be sent.

Candidates may offer at any trial one or more of the subjects required, and the subjects passed at such trial will be placed to their credit on the records of the Regents. In like manner, subjects passed in the regular Regents' examinations in the academies will be allowed and credited to candidates. Should a candidate allow an interval of five years to elapse without passing an additional subject, he will be deemed to have relinquished his candidacy, and will be dropped from the records.

Examinations in the subjects required by the above law, also form a part of the system established by the Regents and conducted in the 308 academical institutions under their visitation throughout the State. The dates for the current academic year are November 18-22, 1889; January 20-24, 1890; March 3-7, 1890; June 9-13, 1890.

While candidates will find the special examinations better adapted to their purpose, they may enter the examinations held in the academies; *provided* in all cases, that they make application to the principal at least two weeks in advance, and pass the examinations in the several subjects at the same time and under the same regulations, as the candidates in attendance at such academies; and *provided*, that they pay to such academies, a fee of one dollar for each subject entered for examination. The answer-papers of persons so examined will be reviewed at the Regents' office in the same order as those of pupils in regular attendance, but they will lose no time by necessary delay at this office, if their papers are satisfactory.

Whenever all the subjects required have been passed by a candidate, and he has mailed to the commissioner, at Albany, a claim specifying when and where each subject was passed, the Regents will grant him a special certificate, known as the *Medical Student's Certificate*. This certificate is to be signed by the commissioner or principal conducting the examination. It will not be issued to pupils in regular attendance at an academy, but only to those who have finished their academic course and are actually entering upon the study of medicine.

The above instructions are subject to such changes as may from time to time be deemed necessary.

EDWARD I. DEVLIN,

Commissioner.

MELVIL DEWEY,

Secretary.

SCHEDULES OF EXAMINATIONS, 1889-'90.

1. *Special Examinations for Medical Students.*

Albany, October 8-10, 1889, October 29-31, 1889, February 18-20, 1890, at the Albany High School.

Binghamton, December 17-19, 1889, at the Binghamton Central High School.

Buffalo, September 30-October 2, 1889, February 4-6, 1890, at the Buffalo High School.

Elmira, May 13-15, 1890, at the Elmira Free Academy.

Ithaca, October 15-17, 1889, at the Ithaca High School.

New York City, October 23-25, 1889, April 1-3, 1890, in the amphitheatre of Bellevue Hospital, 26th St. and 1st Ave.

Poughkeepsie, January 7-9, 1890, at the Poughkeepsie High School.

Rochester, December 10-12, 1889, April 8-10, 1890, at the Rochester Free Academy.

Saratoga Springs, May 27-29, 1890, at the Saratoga Springs High School.

Syracuse, October 3-5, 1889, at Syracuse University, Medical Department, January 21-23, 1890, at St. John's Catholic Academy, Lock Street.

Utica, March 25-27, 1890, at the Utica Public Library.

The order of studies at all examinations will be :

First day—Arithmetic, 10 A. M. to 12.30 P. M.; Geography, 2 to 3 30 P. M.; Orthography, 3.30 to 4.30 P. M.

Second day—English Grammar, 10 A. M. to 12.30 P. M.; American History, 2 to 4.30 P. M.

Third day—Rhetoric and English Composition, 10 A. M. to 12.30 P. M.; Elements of Natural Philosophy, 2 to 4.30 P. M.

All candidates for these special examinations must notify Commissioner Devlin at Albany, by letter, at least one week in advance, stating at what place and in what studies they wish to be examined.

2. *At Academies, Examinations will be held as follows :*

November 18-22, 1889, January 20-24, 1890, March 3-7, 1890, June 9-13, 1890.

All candidates for examination at the academies must notify the principal at least two weeks in advance, stating in what studies they wish to be examined. The principal will then order question-papers for them and inform them of the days and hours of examination.

KINGS COUNTY PHARMACEUTICAL SOCIETY.

The regular meeting of the Kings County Pharmaceutical Society was held on Tuesday, November 12, President Davis in the chair. Mr. Francis Klein was elected to membership.

A letter from Mr. McPherson, the recipient of the Fairlie Medal, was received, stating that he had lost his medal, and asking permission to have another made. The society decided that it was inexpedient to grant his request.

Mr. Perkins, Dr. Eccles, Mr. DeForrest and Mr. Sayre paid eloquent tribute to the memory of Mr. Nicot, deceased. Dr. Eccles then moved that a committee of three be appointed to draft resolutions on the death of Mr. Nicot, and have them engrossed and sent to Mrs. Nicot; carried unanimously. Dr. Eccles, Mr. DeForrest, and Mr. Sayre were appointed such committee. Committee on Trade Matters presented some resolutions complaining of excessive charges to druggists by the Telephone Co. which were passed, and ordered to be sent to the company. Adjourned.

F. N. BLISS, *Secretary*.

AMOUNT OF ALCOHOL IN LIQUORS.

This table shows the proportion of alcohol contained in every 100 parts of the liquors named:

<i>Name of liquor.</i>	<i>Per cent.</i>	<i>Name of liquor.</i>	<i>Per cent.</i>
Small beer, 1 and.....	1.08	Shiraz	15.52
Porter, 3, 5 and.....	5.26	Malmsey	16.40
Brown stout.....	6.80	Sherry.....	17.17
Perry.....	7.26	Malaga.....	17.20
Rhenish	7.58	Alba Flora.....	17.26
Moselle	8.70	Hermitage, white	17.43
Johannisberger.....	8.71	Cape Muscatel.....	18.25
Elder wine.....	8.79	Constantine, red	18.92
Claret ordinaire.....	8.99	Lisbon	18.94
Cider, 5, 2 and....	9.80	Lachryma.....	19.70
Tokay	9.33	Colares.....	19.75
Ale.....	10.00	Teneriffe.....	19.79
Rudesheimer.....	10.72	Currant wine.....	20.55
Marcobrunner	11.60	Madeira.....	22.27
Gooseberry wine... ..	11.84	Port.....	23.00
Hockheimer.....	12.03	Sherry, old.....	23.86
Vin de Grave	12.08	Marsala.....	25.00
Hermitage, red.....	12.32	Raisin wine.....	25.12
Champagne.....	12.61	Madeira Sercial.....	27.40
Amontillado.....	12.63	Cape Maderia ..	29.51
Frontignac.....	12.89	Gin.....	51.60
Barsac.....	13.86	Brandy.....	53.39
Sauterne.....	14.22	Rum.....	53.68
Champagne Burg'y.....	14.57	Irish whisky.....	53.90
White port	15.00	Scotch whisky.....	54.32
Bordeaux.....	15.10		

—*Brooklyn Eagle*.

